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BUSINESS AND CONSUMER MATHEMATICS



CURRICULUM

TEACHERS' EDITION

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BUSINESS AND CONSUMER MATHEMATICS

Teacher Edition

Bruce E. Conchie



ADDISON-WESLEY (CANADA) LTD.

DON MILLS, ONTARIO • READING, MASSACHUSETTS • MENLO PARK, CALIFORNIA • LONDON

With very special recognition to the work of two young teachers, innovators of new ideas within their classroom teaching, and collaborators in the theory of this text.

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and

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BUSINESS AND CONSUMER MATHEMATICS

Teacher Edition

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To My Students . . .

Each one of us has a particular set of problems to solve as we enter the adult world of consumer buying. These problems are dictated by economic situations or conditions, often called "the signs of the times."

The problems of these mid-1970's years are being made very difficult for us. We are faced with the sudden increase of prices of the goods we purchase. The goods we purchase are now coming to us in new measurements. Canadians are living in a time of price inflation. And, Canada has "gone metric!"

Young Canadians can be above these problems. You can succeed as "educated consumers" through accomplishing some realistic goals.

- Be prepared to make decisions on the value of items you buy
 - through increased knowledge of business concepts
 - through good consumer knowledge of the qualities of the goods you buy.
- Be good mathematicians
 - by knowing the mathematics used in the establishing of prices
 - by applying basic mathematics principles to your own shopping.
- Be metric
 - so that you can smile at those of us of the older generation who are having problems with conversion!

It is so that I can be with you in achieving these goals that this book has been designed.

Willowdale, Ontario
April, 1975.

Bruce E. Conchie

On The Contents Of The Book . . .

The pattern of the book incorporates features that I hope will make your study meaningful.

Chapters 1 to 9

This portion of the book is basic mathematics. A good review is always in order before we progress to more advanced concepts. The review of your basic mathematics in these chapters has been designed to be a refresher course. We hope it also relates mathematics to the current scene and that it stresses the value of mathematics in consumerism.

Chapters 10 and 11

These chapters are the inside-workings of retail merchandising. It is the application of mathematics by the retailer to his business, and aids us in understanding his work and his prices.

Chapters 12 to 15

These deal with banking services, simple interest, and compound interest. Attention is given to what these items mean to us as consumers and what the same items mean to the operation of business.

Chapters 16 to the end of the book

These chapters focus our attention on consumerism in adult living. Whether we are discussing installment financing, payment of taxes, purchase of life insurance, or financing a home, the aims are two-fold. To both business and to consumer purchasing, we want to see the relevance of both mathematics and consumer education.

On The Structure Of The Book...

Items given to serve as guideposts in using the book:

—RESEARCH/DISSUSS

At the begining of the major chapters, questions are asked of you. Think about them. They direct our thoughts to the business world around us, make us question business procedures, and they help us to relate the material in the following chapter to the real world around us.

—FACTS AND FIGURES

You will find these scattered through the book, and they need not have a direct relation to textbook material on the same page. They are excerpts from the current real world. Question the facts; what do they mean to us in interpreting the present and in forecasting the future?

—BUSINESS FORMS

The business forms which are used in the illustrations are the ones currently in use in Canada. Compare them with ones we see each day. Keep in mind that there will be provincial differences, especially in the calculation of sales tax.

—THE SHORT STORIES

These are moments of fiction. They do, however, talk about people surprisingly like ourselves. Judge their experiences, criticize their decisions, laugh at their shortcomings—but then take time to question what we would have done in similar circumstances.

—REVIEW

Each chapter has an intensive review. The many questions have been designed to exercise our mathematical skills and to make us question, again and again, the consumer education involved in each. To help you check your own progress, there are extensive answers at the back of the book. In the appendix, also, are the tables for your use.

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BUSINESS AND CONSUMER MATHEMATICS

ADDITION OF WHOLE NUMBERS

CHAPTER 1

NAME <u>Susan Jenkins</u>		DEPT. NO. <u>892</u>		WEEK ENDING <u>April 12, 1976</u>	
		EMPLOYEE NO. <u>4638</u>			

ABSENCE (days) 1. Sick ☒ 2. Holiday _____ 3. Vacation _____ 4. Personal* _____	MONDAY	8	OUT _____ IN _____ OUT <u>12:00</u> IN <u>8:00</u>	ABSENCE (days) 1. Sick _____ 2. Holiday _____ 3. Vacation _____ 4. Personal* _____	THURSDAY	8	OUT <u>5:00</u> IN <u>1:00</u> OUT <u>12:00</u> IN <u>8:00</u>
ABSENCE (days) 1. Sick ☒ 2. Holiday _____ 3. Vacation _____ 4. Personal* _____	TUESDAY	8	OUT _____ IN _____ OUT _____ IN _____	ABSENCE (days) 1. Sick _____ 2. Holiday _____ 3. Vacation _____ 4. Personal* _____	FRIDAY	8	OUT <u>5:00</u> IN <u>1:00</u> OUT <u>12:00</u> IN <u>8:00</u>
ABSENCE (days) 1. Sick _____ 2. Holiday _____ 3. Vacation _____ 4. Personal* _____	WEDNESDAY	0	OUT <u>5:00</u> IN <u>1:00</u> OUT <u>12:00</u> IN <u>8:00</u>	ABSENCE (days) 1. Sick _____ 2. Holiday _____ 3. Vacation _____ 4. Personal* _____	SATURDAY	8	OUT <u>5:00</u> IN <u>1:00</u> OUT <u>12:00</u> IN <u>8:00</u>

* Jury duty, Death, etc.	
TOTAL HRS. <u>40</u> <u>0</u>	Signature <u>Susan Jenkins</u>

SUPERVISOR RECAP					
Regular <u>28</u> <u>0</u> HRS.	Overtime ____ HRS.	Sick <u>12</u> <u>0</u> HRS.	Personal Absence Payable ____ HRS.	Personal Absence Non-Payable ____ HRS.	Vacation Payable ____ HRS.

Signature A. P. Reynolds

Addition is used on time cards to report the total number of hours worked in a week. On this time card, Susan worked 28 hours regular time and was absent 12 hours because of illness. Since she is allowed a certain num-

ber of hours for sick leave, Susan will be paid for the 12 hours she was not at work, in addition to the 28 regular hours.

PRE-TESTS

Write these numbers with words.

1. 31 742 2. 3 824 061 3. 5 431 800 436

Write these numbers using digits.

4. Six hundred forty-one thousand nine hundred twenty
5. Seventy-two million four hundred fifty-nine thousand three hundred two

Align these numbers for addition and find the sums.

1. 9, 28, 341, 16, 82, 3, 6802, 136
2. 3654, 178, 32 192, 40, 1681, 99, 83 124, 602
3. 131 460, 96 083, 4776, 6 148 291, 74 525

Find these sums.

- | | | | | |
|------------|------------|-------------|-------------|------------|
| 1. 469 | 2. 239 | 3. 8583 | 4. 8986 | 5. 185 948 |
| <u>349</u> | <u>373</u> | 7561 | 9816 | 426 557 |
| | | 9347 | 1279 | 718 129 |
| | | 1841 | 7841 | 887 476 |
| | | <u>4178</u> | <u>1761</u> | 213 769 |
| | | | | 742 746 |

Round these numbers to the nearest million.

1. 7 823 194 2. 3 413 864 3. 2 328 284 4. 1 768 687 5. 667 191

Add. Then check your answers by re-adding in the opposite direction and by casting out nines.

- | | | | |
|---------|---------|---------|---------|
| 1. 1476 | 2. 5186 | 3. 6850 | 4. 5947 |
| 2198 | 6259 | 8625 | 6220 |
| 9547 | 3030 | 9133 | 4697 |
| 5124 | 8918 | 8190 | 6171 |

Complete this report showing the classification of student by sex and by class. (Total the numbers horizontally and vertically. The grand totals should balance.)

YEAR	BOYS	GIRLS	TOTALS
1	326	345	(1)
2	371	382	(2)
3	396	410	(3)
4	420	435	(4)
TOTALS	(5)	(6)	(7)

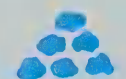
(6) 1572 (7) 3085
 (e) 1. 18 345 2. 33 393 3. 32 798 4. 23 035 (f) 1. 671 (2) 753 (g) 3. 806 (4) 855 (5) 1513
 4. 29 685 5. 17 425 (d) 1. 8 000 000 2. 3 000 000 3. 2 000 000 4. 2 000 000 5. 1 000 000
 6. 641 920 7. 72 459 302 (b) 1. 7417 2. 121 570 3. 6 455 (18) (c) 1. 818 2. 612 3. 31 610
 4. 641 billion four hundred thirty-one million eight thousand four hundred thirty-six
 (sixty-one). 1. Thirty-one thousand seven hundred forty-two 2. Three million eight hundred twenty-four thousand

ANSWERS

1 a / READING AND WRITING NUMBERS

Man first learned to count by using his fingers. When he ran out of fingers, he began using sticks and stones to record his computations. Each time there were 10 stones in the first pile (called *ones*), the stones were removed and replaced with a single stone in the next pile, called *tens*. Each time the tens pile had 10 stones, they were removed and replaced by a single stone in the next adjacent pile, called *hundreds*. So, each stone in a higher position represented ten times the value of a stone in the next lower position. Thus, the piles of stones shown below represent the number 6375.

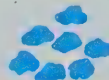
Billions	
Hundred millions	
Ten millions	
Millions	
Hundred thousands	
Ten Thousands	
Thousands	
Hundreds	
Tens	
Ones	
1	6 9 8 2 3 5 4 1 6



6 thousands



3 hundreds



7 tens



5 ones

After man invented writing materials, he no longer needed to count and record with sticks and stones. However, our system of counting is still based on 10 digits and on the position of the digits (called *place value*). The place value positions for our base 10 system are shown to the left.



The number 1 698 235 416 is read *one billion, six hundred ninety-eight million, two hundred thirty-five thousand, four hundred sixteen*.

EXERCISES Read and write these numbers with words. *Answers are in back of book.*

- | | | | |
|----------------|-------------------|-------------------|-------------------|
| 1. 62 | 2. 567 | 3. 6932 | 4. 7904 |
| 5. 46 170 | 6. 531 039 | 7. 8 302 782 | 8. 18 458 915 |
| 9. 390 389 755 | 10. 2 182 782 456 | 11. 7 441 396 070 | 12. 8 156 924 538 |

Write these numbers using digits (0,1,2,3,4,5,6,7,8,9).

- | | |
|--|---|
| 13. Ninety-seven 97 | 14. Five hundred twenty-two 522 |
| 15. Six thousand four hundred forty-one 6441 | 16. Forty-eight thousand one hundred forty-two 48 142 |
| 17. Nine hundred seventy-eight thousand six hundred eight 978 608 | 18. Nine million two hundred thousand nine hundred thirty-five 9 200 935 |
| 19. Ninety-two million seven hundred fifty thousand seven hundred twenty 92 750 720 | 20. One hundred thirty-three million nine hundred forty-eight thousand seven hundred seventeen 133 948 717 |

When listing numbers which are to be added, be sure that all the ones are lined up in the ones position, all the tens in the tens position, hundreds in the hundreds position, and so on.

Tell the class that failure to do this makes the addition job harder and causes mistakes.

Neatness and accuracy are closely related.



EXAMPLE

Align these numbers for addition and find the sum: 705, 54 977, 1436, 1401, 243 814, 869, and 36.

Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones
				7	0
	5	4	9	7	7
		1	4	3	6
		1	4	0	1
2	4	3	8	1	4
			8	6	9
				3	6
3	0	3	2	3	8

EXERCISES Align these numbers for addition and find the sums.

- | | |
|--|---|
| <p>1. 4, 22, 36, 43, 8, 16, 95, 6, 40, 15 285</p> <p>3. 94, 5, 16, 1, 45, 76, 22, 8, 7, 36 310</p> <p>5. 95, 45, 872, 36, 271, 89, 663, 60,
123 2254</p> <p>7. 145, 81, 39, 26, 809, 275, 504, 51,
47 1977</p> <p>9. 162, 4514, 3096, 8700, 563, 27, 8729,
6345 32 136</p> <p>11. 255, 6801, 94 349, 27 456, 6347, 870
136 078</p> <p>13. 5047, 83 247, 51 879, 994 363, 21 673,
502 1 156 711</p> <p>15. 64 076, 289 789, 1 251 554, 201 183,
5 806 736 7 613 338</p> | <p>2. 17, 2, 8, 60, 88, 13, 35, 7, 75, 9 314</p> <p>4. 3, 87, 57, 24, 8, 19, 8, 93, 6, 50 355</p> <p>6. 481, 10, 502, 45, 7, 90, 981, 734 2850</p> <p>8. 632, 4896, 698, 7731, 23, 915, 7879,
2481 25 255</p> <p>10. 9248, 71 039, 27 257, 879, 1456,
63 524 173 403</p> <p>12. 8989, 20 312, 550 194, 45 313, 1267,
357 626 432</p> <p>14. 989 159, 94 362, 673, 50 831, 804 372,
512 1 939 909</p> <p>16. 548 956, 4 120 728, 309 371, 69 436,
5 032 170 10 080 661</p> |
|--|---|

1 C / GAINING SPEED IN ADDING

To use addition effectively, you have to be able to add quickly and accurately.



- Don't move your lips.
- Don't recite to yourself.
- Add at a constant rate—avoid pauses and spurts.
- Use a pencil as a pointer to pace yourself.
- Concentrate.

If you know the sums of the number combinations, adding numbers is easy. Here are some short cuts.

- (1) If the addends have the same number combination in the ones position, the sum will always have the same digit in the ones position.

$$\begin{array}{r} 5 \quad 5 \quad 5 \quad 15 \quad 35 \quad 55 \quad 75 \quad 95 \\ 7 \quad 17 \quad 47 \quad 7 \quad 17 \quad 47 \quad 137 \quad 247 \\ \hline 12 \quad 22 \quad 52 \quad 22 \quad 52 \quad 102 \quad 212 \quad 342 \end{array}$$

The addends in the ones position are all 5 and 7, therefore, the digit in the ones position in the sum is always 2.

- (2) Group pairs of numbers by inspection and add the groups.

$$\begin{array}{r} 3 \rightarrow 3 + 4 = 7 \\ 4 \rightarrow 2 + 5 = 7 \\ 2 \rightarrow 3 + 4 = 7 \\ 5 \rightarrow 2 + 5 = 7 \\ \hline 14 \end{array} \rightarrow \text{add } 7 + 7 = 14$$

$$\begin{array}{r} 2 \rightarrow 3 \\ 1 \rightarrow 3 \\ 4 \rightarrow 7 \\ 3 \rightarrow 7 \\ \hline 10 \end{array} \rightarrow = 10$$



Learn to recognize instantly the combinations that make 10:
1 + 9, 2 + 8, 3 + 7, 4 + 6, 5 + 5.

EXERCISES Find these sums. Work as quickly as you can.

1. $\begin{array}{r} 4 \\ 5 \\ \hline 9 \end{array}$	$\begin{array}{r} 6 \\ 4 \\ \hline 10 \end{array}$	$\begin{array}{r} 7 \\ 9 \\ \hline 16 \end{array}$	$\begin{array}{r} 2 \\ 4 \\ \hline 6 \end{array}$	$\begin{array}{r} 9 \\ 2 \\ \hline 11 \end{array}$	$\begin{array}{r} 4 \\ 8 \\ \hline 12 \end{array}$	$\begin{array}{r} 5 \\ 7 \\ \hline 12 \end{array}$	$\begin{array}{r} 2 \\ 7 \\ \hline 9 \end{array}$	$\begin{array}{r} 6 \\ 3 \\ \hline 9 \end{array}$	$\begin{array}{r} 5 \\ 6 \\ \hline 11 \end{array}$	$\begin{array}{r} 3 \\ 1 \\ \hline 4 \end{array}$	$\begin{array}{r} 7 \\ 6 \\ \hline 13 \end{array}$	$\begin{array}{r} 1 \\ 7 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ 5 \\ \hline 13 \end{array}$
2. $\begin{array}{r} 569 \\ 817 \\ \hline 1386 \end{array}$	$\begin{array}{r} 345 \\ 742 \\ \hline 1087 \end{array}$	$\begin{array}{r} 637 \\ 981 \\ \hline 1618 \end{array}$	$\begin{array}{r} 727 \\ 359 \\ \hline 1086 \end{array}$	$\begin{array}{r} 492 \\ 627 \\ \hline 1119 \end{array}$	$\begin{array}{r} 549 \\ 789 \\ \hline 1338 \end{array}$	$\begin{array}{r} 838 \\ 427 \\ \hline 1265 \end{array}$	$\begin{array}{r} 938 \\ 111 \\ \hline 1049 \end{array}$	$\begin{array}{r} 829 \\ 624 \\ \hline 1453 \end{array}$	$\begin{array}{r} 745 \\ 416 \\ \hline 1161 \end{array}$				
3. $\begin{array}{r} 5493 \\ 1441 \\ 7542 \\ 1846 \\ 8861 \\ \hline 25183 \end{array}$	$\begin{array}{r} 9485 \\ 8752 \\ 9566 \\ 8361 \\ 5762 \\ \hline 41926 \end{array}$	$\begin{array}{r} 1976 \\ 1427 \\ 8393 \\ 2549 \\ 4389 \\ \hline 18734 \end{array}$	$\begin{array}{r} 8334 \\ 7128 \\ 7948 \\ 6964 \\ 3371 \\ \hline 33745 \end{array}$	$\begin{array}{r} 1861 \\ 9661 \\ 1729 \\ 5721 \\ 2349 \\ \hline 21321 \end{array}$	$\begin{array}{r} 2589 \\ 2335 \\ 9565 \\ 4958 \\ 2715 \\ \hline 22162 \end{array}$	$\begin{array}{r} 194233 \\ 777546 \\ 363424 \\ 122933 \\ 869586 \\ 345728 \\ \hline 2673450 \end{array}$	$\begin{array}{r} 722868 \\ 179167 \\ 385846 \\ 731949 \\ 174848 \\ 391616 \\ 2586294 \end{array}$						

1 d / ESTIMATING OR ROUNDING NUMBERS

Let us compare the population of British Columbia with Manitoba. According to the Canadian Census of 1971,

British Columbia: 2 184 621 persons
Manitoba: 988 247 persons

A fractional comparison between 2 184 621 and 988 247 would not be meaningful or useful in many cases. To make these figures easier to work with, we can *round* them to the nearest million and use the rounded figures for the comparison.

Since 2 184 621 is nearer to 2 000 000 than to 3 000 000, we can say that the population of British Columbia rounded to the nearest million is 2 000 000. Similarly, 988 247 is near 1 000 000, therefore, we can say the population of Manitoba rounded to the nearest million is 1 000 000. A fractional comparison shows that the population of Manitoba is *about one half* that of British Columbia, or we can say that British Columbia has *twice as many* people as Manitoba.

Point out that people, except very young children, round their ages to the last birthday.

Rounding large numbers makes them easier to deal with in arithmetic problems. As an example of this, ask the class how they could quickly find the total population of the provinces and territories listed in the exercise.

In rounding numbers, use the next highest value when the amount is one-half or more.



For example, if the population of British Columbia had been 2 499 999, we would still round it to the nearest million at 2 million. If the population had been 2 500 000, we would round it to the nearest million at 3 million.

EXAMPLE

The population of Alberta is 1 627 874. Round it to the nearest million persons, then to the nearest 100 000 persons.

1 627 874 rounded to the nearest million is 2 000 000
1 627 874 rounded to the nearest 100 000 is 1 600 000

EXERCISES Round these populations first to the nearest million persons, then to the nearest 100 000 persons.

1. New Brunswick: 634 557 1 000 000
 600 000

6. Quebec: 6 027 764 6 000 000
 6 000 000

2. Newfoundland: 522 104 1 000 000
 500 000

7. Saskatchewan: 926 242 1 000 000
 900 000

3. Nova Scotia: 788 960 1 000 000
 800 000

8. Yukon Territory: 18 388 —
 —

4. Ontario: 7 703 106 8 000 000
 7 700 000

9. Northwest Territories: 34 807 —
 —

5. Prince Edward Island: 111 641 —
 100 000

10. Canada: 21 568 311 22 000 000
 21 600 000

1e / CHECKING THE ACCURACY OF TOTALS

Another quick check for accuracy uses the skills of the previous section to see if answers are reasonable.

Explain that transposed digits cannot be detected by casting out nines.

There are various methods of checking a sum for accuracy—you can re-add, add subtotals, add columns separately, or cast out nines.

- (1) When you re-add, add in the opposite direction. First add down, then add up, or first add up, then add down.
- (2) When you add subtotals, first divide the problem into two parts, then find the subtotal for each part, and then add the subtotals.

$$\begin{array}{r}
 3511 \\
 4623 \\
 1784 \\
 8956 \\
 \hline
 18874
 \end{array}
 \quad
 \begin{array}{r}
 3511 \\
 4623 \\
 \hline
 8134 \\
 1784 \\
 8956 \\
 \hline
 10740 \\
 8134 \\
 10740 \\
 \hline
 18874
 \end{array}$$

- (3) When you add columns separately, record the sums in the correct place value positions.

2519	Check:	2	5	1	9	20
5432		5	4	3	2	17
1693		1	6	9	3	22
3746		3	7	4	6	11
<u>13390</u>		11	22	17	20	13390

- (4) When you cast out nines, first add the digits of the sum and each addend horizontally. Then add the digits in each of these totals until a single digit remains for each. Then reduce the sum of the single digits obtained for each addend to a single digit.

958	Check:	$9 + 5 + 8 = 22$	$2 + 2 = 4$
572		$5 + 7 + 2 = 14$	$1 + 4 = 5$
112		$1 + 1 + 2 = 4$	$= 4$
138		$1 + 3 + 8 = 12$	$1 + 2 = 3$
<u>1780</u>		$1 + 7 + 8 + 0 = 16$	16
		$1 + 6 = 7$	$1 + 6 = 7$

Casting out nines is not a perfect test for checking accuracy. If an answer *doesn't* check, it's wrong; but the answer can check and still be wrong.

EXERCISES Find these sums and then check your answers by re-adding, by adding subtotals, by adding columns, and by casting out nines.

1.
$$\begin{array}{r}
 4622 \\
 1696 \\
 5315 \\
 9839 \\
 \hline
 21472
 \end{array}$$

2.
$$\begin{array}{r}
 1337 \\
 9554 \\
 4665 \\
 5462 \\
 \hline
 21018
 \end{array}$$

3.
$$\begin{array}{r}
 1271 \\
 7934 \\
 8223 \\
 3796 \\
 \hline
 21224
 \end{array}$$

4.
$$\begin{array}{r}
 5429 \\
 2789 \\
 4843 \\
 3241 \\
 \hline
 16302
 \end{array}$$

1f / HORIZONTAL AND VERTICAL ADDITION

On many occasions it is necessary to add horizontal figures. Scores of football, basketball, and hockey games are often given in horizontal form. Frequently, accounting and statistical data are presented in tabular form (tables) in which both horizontal and vertical totals are required.

EXAMPLE

Complete this sales report to show the number of sales made by the different salesmen and the number of sales made by months of the year.

SALESMAN	JANUARY	FEBRUARY	MARCH	TOTALS
Sanderson	496	384	512	1392
Hull	526	497	499	1522
Gray	386	450	587	1423
Desjardins	409	398	435	1242
Green	615	586	607	1808
TOTALS	2432	2315	2640	7387

Point out that by adding horizontally, you don't have to copy the numbers in a vertical column. This both saves time and prevents errors in copying.

EXERCISES Complete these tables by adding horizontally and vertically. The horizontal grand total and the vertical grand total should be the same.

1. Paul, Tom, David, and John bowled for the class team in the intramural competition.

BOWLER	GAME #1	GAME #2	GAME #3	TOTALS
Paul	175	192	154	521
Tom	198	185	173	556
David	183	191	196	570
John	166	177	180	523
TOTALS	722	745	703	2170

2. Prepare this report showing the classification of students by sex and schools.

SCHOOL	MALE	FEMALE	TOTALS
Westview	435	567	1002
A. Y. Jackson	787	654	1441
Central Commerce	595	1432	2027
Sir Wilfrid Laurier	794	867	1661
Parkdale	937	1102	2039
Sir John A. Macdonald	623	718	1341
TOTALS	4171	5340	9511

REVIEW / ADDITION OF WHOLE NUMBERS

MIXED PROBLEMS

Find these sums.

- Four hundred twenty-three plus six thousand nine hundred eleven plus four plus eight hundred seventeen. **8155**
- Seventy-eight plus twenty-nine thousand sixty-seven plus nine hundred eight. **30 053**
- Seven hundred eight thousand plus six thousand plus fifty thousand two hundred thirty-five plus seventy-four. **764 309**
- Three thousand six hundred fifty-four plus ninety-nine plus six hundred two plus eighty-three thousand one hundred twenty-four. **87 479**

Add and round your answer to the nearest hundred.

- | | |
|-------------------------|--------------------------|
| 5. 31 510 | 6. 213 769 |
| 29 683 | 818 |
| 8986 | 32 192 |
| 4178 | 4776 |
| 373 | 78 |
| 74 730 | 251 633 |
| 74 700 (rounded) | 251 600 (rounded) |
-
- | | |
|-------------------------|--------------------------|
| 7. 6802 | 8. 87 476 |
| 469 | 174 625 |
| 18 129 | 501 |
| 2746 | 3194 |
| 612 | 62 |
| 28 758 | 265 858 |
| 28 800 (rounded) | 265 900 (rounded) |

Round each number to the nearest hundred. Then add the rounded numbers.

- | | |
|-------------------------|----------------------------|
| 9. 31 510 31 500 | 10. 213 769 213 800 |
| 29 683 29 700 | 818 800 |
| 8986 9000 | 32 192 32 200 |
| 4178 4200 | 4776 4800 |
| 373 400 | 78 100 |
| 74 800 | 251 700 |
-
- | | |
|----------------------|--------------------------|
| 11. 6802 6800 | 12. 87 476 87 500 |
| 469 500 | 174 625 174 600 |
| 18 129 18 100 | 501 500 |
| 2746 2700 | 3194 3200 |
| 612 600 | 62 100 |
| 28 700 | 265 900 |

Add these numbers horizontally and vertically. The grand totals should balance.

				TOTALS
	43	9	71	(13) 123
	91	82	4	(14) 177
	78	27	55	(15) 160
	11	49	36	(16) 96
TOTALS	(17) 223	(18) 167	(19) 166	(20) 556

WORD PROBLEMS

- Arnold played 18 holes of golf with the scores on each hole as follows:

First nine

Hole no.	1	2	3	4	5	6	7	8	9
Par	4	4	3	5	4	4	4	5	3 36
Arnold	5	7	4	4	5	5	4	7	3 44

Second nine

Hole no.	10	11	12	13	14	15	16	17	18
Par	4	5	4	4	3	4	5	4	3 36
Arnold	6	5	5	5	2	5	6	4	5 43

- What was Arnold's score for each nine holes? What **87** was his score for the eighteen holes? What is par for each nine and for the eighteen?

- Frank had a stamp collection. He had 1095 Canadian stamps, 537 English stamps, 682 French stamps, 414 Danish stamps, 613 Norwegian stamps, 758 Italian stamps, 319 German stamps, 252 Austrian stamps, 758 Spanish stamps, and 476 Portuguese stamps. How many stamps did he have in his collection? **5904**
- George took a summer vacation and drove his car from Toronto to Ottawa to Montreal to Kirkland Lake to North Bay to Sudbury and back to Toronto. The distance from Toronto to Ottawa by car is 453 kilometres; from Ottawa to Montreal, 198 kilometres; from Montreal to Kirkland Lake, 477 kilometres; from Kirkland Lake to North Bay, 245 kilometres; from North Bay to Sudbury, 130 kilometres; from Sudbury to Toronto, 420 kilometres. How many kilometres did George travel? **1923**

4. Christine, Louise, and Carl were working on a project and decided to keep a daily record of the hours spent by each of them, each day, for one complete week.

	Mon	Tues	Wed	Thurs	Fri
18 Christine	4	4	0	7	3
28 Louise	8	8	6	1	5
Carl	0	0	3	2	0

How many hours did Christine spend on the project? How many did Louise spend? How many did Carl spend? What was the total hours spent on the project for the week? 51

5. John raises fish and sells them to various aquarium and pet stores. One week he filled the following orders:

	Jake's Aquarium	Undersea Aquarium	Sandi's Pet Shop	The Fish Store
guppies	52	30	18	22
angel fish	38	45	13	45
swordtails	12	0	0	38
black mollies	0	25	9	20
spotted mollies	0	15	11	15
	102	115	51	140

How many of each kind of fish did he sell? How many fish did each store buy?

6. Henry's department checks parts for a bicycle factory—sorting them either as acceptable or as rejects. On Monday, they found 493 acceptable parts and 2 rejects; on Tuesday, 561 acceptable and 4 rejects; on Wednesday, 389 acceptable and 9 rejects; on Thursday, 461 acceptable and 6 rejects; and on Friday, 533

acceptable and no rejects. How many acceptable parts did they find for the week? 2437 How many rejects? 21

CHECK YOUR PROGRESS

Write these numbers with words.

1. 77 292 231 2. 81 654
3. 612 521 007 4. 2 860 023

Align these numbers for addition and find the sums.

5. 38 4 760 3508 81 629 5020
6. 4 503 600 1998 48 077 246 37 816 4 591 737

Round these numbers to the nearest million.

7. 9 706 397 10 000 000 8. 632 772 1 000 000
9. 2 853 214 3 000 000 10. 3 257 022 3 000 000

Find these sums. Check your answers by casting out nines.

- | | | |
|----------|----------|----------|
| 11. 9446 | 12. 6653 | 13. 3642 |
| 4832 | 1592 | 4168 |
| 6831 | 3129 | 8698 |
| 6869 | 5743 | 2922 |
| 27 978 | 17 117 | 19 430 |
-
- | | |
|----------|----------|
| 14. 1259 | 15. 1186 |
| 2787 | 9756 |
| 5996 | 5573 |
| 3214 | 4822 |
| 13 256 | 21 337 |

Add these horizontally.

16. $48 + 23 + 46$ 117 17. $35 + 49 + 95$ 179
18. $88 + 21 + 46$ 155 19. $348 + 839 + 286$ 1473
20. $796 + 123 + 572 + 225$ 1716

$$\text{Total} = 65$$

Answers to Check Your Progress

1. Seventy-seven million two hundred ninety-two thousand two hundred thirty-one 3. Six hundred twelve million five hundred twenty-one thousand seven
2. Eighty-one thousand six hundred fifty-four 4. Two million eight hundred sixty thousand twenty-three

SUBTRACTION OF WHOLE NUMBERS

CHAPTER 2

STOCKROOM REPORT

DEPARTMENT Children's Wear

WEEK BEGINNING December 20, 1976

ITEM NUMBER	DESCRIPTION	UNITS ON HAND		SENT TO DEPARTMENT
		BEGINNING OF WEEK	END OF WEEK	
XL 4631	Girls socks	1296	189	1107
XC 298	Girls sweaters	364	103	261
AN 4438	Girls nightgowns	428	96	332
XM 333	Girls dresses	983	228	755
GD 969	Boys trousers	341	143	198
CN 4683	Boys pajamas	459	187	272
GK 8755	Boys T-shirts	681	255	426
GC 796	Boys sweaters	388	79	309

Well-run businesses keep close records of their merchandise, so that they will always know exactly how many items are in stock. Stock clerks count the merchandise in the stockroom and enter the totals at the beginning of the week and at the end of the week. The number sent

to the department is found by subtraction. If there are deliveries during the week, the number sent to the department is found by adding the deliveries to the beginning of the week totals and subtracting the end of the week totals.

PRE-TESTS

Find these differences.

1.
$$\begin{array}{r} 9 \\ - 5 \\ \hline \end{array}$$
2.
$$\begin{array}{r} 7 \\ - 2 \\ \hline \end{array}$$
3.
$$\begin{array}{r} 15 \\ - 6 \\ \hline \end{array}$$
4.
$$\begin{array}{r} 12 \\ - 6 \\ \hline \end{array}$$
5.
$$\begin{array}{r} 16 \\ - 10 \\ \hline \end{array}$$

a

Find these differences

1.
$$\begin{array}{r} 5199 \\ - 43 \\ \hline \end{array}$$
2.
$$\begin{array}{r} 9513 \\ - 409 \\ \hline \end{array}$$
3.
$$\begin{array}{r} 3155 \\ - 619 \\ \hline \end{array}$$
4.
$$\begin{array}{r} 78\,903 \\ - 68\,065 \\ \hline \end{array}$$
5.
$$\begin{array}{r} 55\,321 \\ - 9774 \\ \hline \end{array}$$

b

Find the differences. Check your answers.

1.
$$\begin{array}{r} 775 \\ - 63 \\ \hline \end{array}$$
2.
$$\begin{array}{r} 851 \\ - 74 \\ \hline \end{array}$$
3.
$$\begin{array}{r} 703 \\ - 536 \\ \hline \end{array}$$
4.
$$\begin{array}{r} 1006 \\ - 644 \\ \hline \end{array}$$
5.
$$\begin{array}{r} 87\,040 \\ - 5944 \\ \hline \end{array}$$

c

Complete this stockroom report by subtracting horizontally.

Item	On Hand		Sent to Department
	Beginning of week	End of week	
Slacks	936	672	(1)
Dresses	593	289	(2)
Socks	538	367	(3)
Sweaters	829	542	(4)
Shirts	888	582	(5)
Pajamas	928	422	(6)
Coats	509	218	(7)

d

ANSWERS (a) 1. 4 2. 5 3. 9 4. 6 5. 6 (b) 1. 5156 2. 9104 3. 2496 4. 10888 5. 45547 (c) 1. 712 2. 777 3. 167 4. 362 5. 81096 (d) (1) 264 (2) 304 (3) 171 (4) 287 (5) 306 (6) 506 (7) 291

2a / FUNDAMENTAL CONCEPTS

Subtraction is often called the inverse (or reverse) of addition because it reverses the addition process.

Point out that since subtraction is the inverse of addition, the student is actually finding an addend.

Adding 4

$$\textcircled{5} + 4 = 9$$



and then subtracting 4

$$9 - 4 = \textcircled{5}$$

We can solve a subtraction problem by thinking about the related addition problem.

EXAMPLE

Subtract: $11 - 6$

Think: What number added to 6 equals 11?

Since $6 + 5 = 11$



$$11 - 6 = 5$$

Do you recall the methods we used to gain speed in addition? Many of these same methods can be applied to gain speed in subtraction.



Don't move your lips.
Don't recite to yourself.
Practice working fast.
Concentrate.

EXERCISES See how quickly you can find these differences.

$$\begin{array}{r} 1. \quad 6 \\ - 5 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 2. \quad 8 \\ - 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 3. \quad 9 \\ - 3 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 4. \quad 7 \\ - 7 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 5. \quad 5 \\ - 2 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 6. \quad 10 \\ - 1 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 7. \quad 12 \\ - 7 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 8. \quad 11 \\ - 8 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 9. \quad 15 \\ - 8 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 10. \quad 13 \\ - 3 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 11. \quad 14 \\ - 9 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 12. \quad 16 \\ - 11 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 13. \quad 18 \\ - 9 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 14. \quad 14 \\ - 8 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 15. \quad 19 \\ - 12 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 16. \quad 17 \\ - 8 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 17. \quad 15 \\ - 6 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 18. \quad 19 \\ - 13 \\ \hline 6 \end{array}$$

You may have learned to subtract larger numbers by thinking about regrouping the numbers and using place value.

EXAMPLE

Subtract: $1876 - 754$

First we write each number in expanded form.

$$1876 = 1000 + 800 + 70 + 6$$

$$754 = 700 + 50 + 4$$

Then we subtract.

$$\begin{array}{r} 1876 = 1000 + 800 + 70 + 6 \\ - 754 = \quad \quad - (700 + 50 + 4) \\ \hline 1000 + 100 + 20 + 2 = 1122 \end{array}$$

$$\blacksquare 1876 - 754 = 1122.$$

EXAMPLE

Subtract: $1489 - 397$

Written in expanded form, these numbers become:

$$1489 = 1000 + 400 + 80 + 9$$

$$\begin{array}{r} - 397 = \quad \quad - (300 + 90 + 7) \\ \hline \quad \quad \quad ? + 2 \end{array}$$

Since we cannot subtract 90 from 80, we have to regroup 1489 as $1000 + 300 + 180 + 9$. Now we can subtract:

$$\begin{array}{r} 1489 = 1000 + 300 + 180 + 9 \\ - 397 = \quad \quad - (300 + 90 + 7) \\ \hline 1000 + \quad 0 + 90 + 2 \end{array}$$

$$\blacksquare 1489 - 397 = 1092.$$

The simple mathematical explanation of the old-fashioned "borrow" is explained here.

We have learned to shorten this method by not writing out the numbers in the expanded form.

$$\begin{array}{r} 318 \\ 14\cancel{8}9 \\ - 397 \\ \hline 1092 \end{array}$$

EXERCISES Find these differences.

$$\begin{array}{r} 1. \quad 643 \\ - 304 \\ \hline 339 \end{array}$$

$$\begin{array}{r} 2. \quad 832 \\ - 589 \\ \hline 243 \end{array}$$

$$\begin{array}{r} 3. \quad 2784 \\ - 873 \\ \hline 1911 \end{array}$$

$$\begin{array}{r} 4. \quad 6029 \\ - 737 \\ \hline 5292 \end{array}$$

$$\begin{array}{r} 5. \quad 4875 \\ - 996 \\ \hline 3879 \end{array}$$

$$\begin{array}{r} 6. \quad 1323 \\ - 1154 \\ \hline 169 \end{array}$$

$$\begin{array}{r} 7. \quad 2304 \\ - 1196 \\ \hline 1108 \end{array}$$

$$\begin{array}{r} 8. \quad 4631 \\ - 2756 \\ \hline 1875 \end{array}$$

$$\begin{array}{r} 9. \quad 88754 \\ - 699 \\ \hline 88055 \end{array}$$

$$\begin{array}{r} 10. \quad 60215 \\ - 9126 \\ \hline 51089 \end{array}$$

2 C / CHECKING ACCURACY OF DIFFERENCES

Since subtraction is the inverse of addition, you can check your answer in a subtraction problem by adding.



$$20 - 14 = 6$$



$$6 + 14 = 20$$

Remind students again that checking is possible because of inverses.

EXAMPLE

Subtract: $435 - 312$

$$\begin{array}{r} 435 \\ - 312 \\ \hline 123 \end{array}$$

$$\begin{array}{r} 312 \\ + 123 \\ \hline 435 \end{array}$$

■ Therefore, 123 is correct.

EXAMPLE

Subtract: $909 - 428$

$$\begin{array}{r} 909 \\ - 428 \\ \hline 481 \end{array}$$

$$\begin{array}{r} \text{Check: } 428 \\ + 481 \\ \hline 909 \end{array}$$

■ Therefore, 481 is correct.

EXAMPLE

Subtract: $3014 - 999$

$$\begin{array}{r} 3014 \\ - 999 \\ \hline 2015 \end{array}$$

$$\begin{array}{r} \text{Check: } 999 \\ + 2015 \\ \hline 3014 \end{array}$$

■ Therefore, 2015 is correct.

EXERCISES Find the differences. Check your answers.

1. $\begin{array}{r} 94 \\ - 37 \\ \hline 57 \end{array}$

2. $\begin{array}{r} 128 \\ - 49 \\ \hline 79 \end{array}$

3. $\begin{array}{r} 362 \\ - 75 \\ \hline 287 \end{array}$

4. $\begin{array}{r} 567 \\ - 321 \\ \hline 246 \end{array}$

5. $\begin{array}{r} 648 \\ - 493 \\ \hline 155 \end{array}$

6. $\begin{array}{r} 1089 \\ - 777 \\ \hline 312 \end{array}$

7. $\begin{array}{r} 7602 \\ - 539 \\ \hline 7063 \end{array}$

8. $\begin{array}{r} 5417 \\ - 3996 \\ \hline 1421 \end{array}$

9. $\begin{array}{r} 20\,095 \\ - 336 \\ \hline 19\,759 \end{array}$

10. $\begin{array}{r} 51\,143 \\ - 8566 \\ \hline 42\,577 \end{array}$

2 d / HORIZONTAL SUBTRACTION

In business, subtraction problems are frequently written horizontally. You should subtract in this form rather than write the problem vertically.

$$7 - 3 = 4$$

$$49 - 16 = 33 \quad (\text{Think: } 9 - 6 = 3; 4 - 1 = 3)$$

$$327 - 45 = 282 \quad (\text{Think: } 7 - 5 = 2; 32 - 4 = 28)$$

$$\begin{array}{r} 713 \\ 835 \end{array} - 543 = 292 \quad (\text{Think: } 5 - 3 = 2; 13 - 4 = 9; 7 - 5 = 2)$$

This type of subtraction is more difficult so students may need additional practice.

EXAMPLE

Complete this stockroom report by subtracting horizontally.

Item	On Hand		Sent to Department
	Beginning of week	End of week	
Wallets	672	381	291
Purses	869	677	192
Belts	341	158	183
Gloves	587	209	378
Ties	239	74	165
Hats	477	298	179

EXERCISES Complete these stockroom reports. In Exercise 2, add the Beginning of Week and the Deliveries to find the Total on Hand. Then subtract the End of Week to find the Sent to Department.

1.

Item	On Hand		Sent to Department
	Beginning of week	End of week	
Handbags	856	298	558
Gloves	375	184	191
Scarves	524	144	380
Belts	476	238	238
Wallets	709	347	362
Socks	622	352	270

2.

Item	Beginning of week	Deliveries	Total on Hand	End of week	Sent to Department
Toasters	201	60	261	198	63
Blenders	150	50	200	89	111
Can Openers	170	65	235	122	113
Knife Sharpeners	118	75	193	136	57
Electric Knives	232	40	272	205	67
Electric Fry Pans	135	50	185	128	57

REVIEW / SUBTRACTION OF WHOLE NUMBERS

MIXED PROBLEMS

Write the missing values.

- $13 - 9 = \underline{4}$ because $\underline{4} + 9 = 13$
- $16 - 4 = \underline{12}$ because $\underline{12} + 4 = 16$
- $9 - 3 = \underline{6}$ because $\underline{6} + 3 = 9$
- $18 - 12 = \underline{6}$ because $\underline{6} + 12 = 18$
- $14 - 8 = \underline{6}$ because $\underline{6} + 8 = 14$
- $11 - 7 = \underline{4}$ because $\underline{4} + 7 = 11$

Find the missing values.

- $$\begin{array}{r} 4361 = 4000 + 300 + \underline{60} + 1 \\ - 240 \quad - (200 + \underline{40} + 0) \\ \hline \underline{4000} + 100 + 20 + \underline{1} = \underline{4121} \end{array}$$
- $$\begin{array}{r} 74\,923 = 70\,000 + \underline{4000} + 900 + 20 + \underline{3} \\ - 8649 = \quad - (8000 + \underline{600} + 40 + 9) \\ \hline = 60\,000 + \underline{14\,000} + 800 + \underline{110} + 13 \\ \hline = \quad - (8000 + \underline{600} + 40 + 9) \\ \hline \underline{60\,000} + \underline{6000} + 200 + \underline{70} + 4 = \underline{66\,274} \end{array}$$

Subtract.

- $$\begin{array}{r} 9651 \\ - 378 \\ \hline \underline{9273} \end{array}$$
- $$\begin{array}{r} 10\,052 \\ - 961 \\ \hline \underline{9091} \end{array}$$
- $$\begin{array}{r} 144\,322 \\ - 88\,265 \\ \hline \underline{56\,057} \end{array}$$
- $$\begin{array}{r} 43\,601 \\ - 25\,777 \\ \hline \underline{17\,824} \end{array}$$
- $$\begin{array}{r} 553\,718 \\ - 409\,769 \\ \hline \underline{143\,949} \end{array}$$

Complete this warehouse inventory report by subtracting horizontally.

Item	On Hand		Sent to stores
	Beginning of month	End of month	
Pens	581	398	(14) <u>183</u>
Pencils	434	275	(15) <u>159</u>
Erasers	367	186	(16) <u>181</u>
Rulers	453	287	(17) <u>166</u>
Blotters	519	175	(18) <u>344</u>
Crayons	376	288	(19) <u>88</u>
Binders	452	366	(20) <u>86</u>

WORD PROBLEMS

- Carl, Lloyd, Graham, and Bob were running for student council president. Carl received 483 votes; Lloyd, 209 votes; Graham, 501 votes; and Bob, 84 votes. How many more votes did Graham receive than Lloyd? 292
417 How many more than Bob? How many more than Carl? 18
- The population of Edmonton in 1966 was 401 299. In 1971, it was 495 702. What was the increase in the population during the five-year period? 94 403
- Steven keeps a record of the total number of floor tiles manufactured in his department each week, the number rejected, and the number acceptable. The following table shows the count for one week.

	Total	Rejected	Acceptable
Monday	1323	29	
Tuesday	1146	18	
Wednesday	1501	32	
Thursday	1433	18	
Friday	1046	17	

- How many acceptable floor tiles were manufactured on Wednesday? How many acceptable floor tiles were manufactured for the week? 6335
- Peter delivers newspapers to newstands throughout the city. One morning he loaded 213 bundles into a truck. At his first stop, he delivered 27 bundles; at his second, 19 bundles; at his third, 12 bundles. How many bundles were left for the remainder of his deliveries? 155
 - Mark drove from Montreal to Toronto. On his way there, he stopped in at Ottawa. From Montreal to Ottawa is 198 kilometres and from Ottawa to Toronto is 453 kilometres. On his return home, he drove 588 kilometres. How much shorter was his return trip? 63 kilometres
 - Wayne drives a transport truck that carries a maximum load of 10 070 kilograms. He has been asked to transport five crates weighing 1797 kilograms, 1897 kilograms, 2366 kilograms, 1411 kilograms, and 1355 kilograms. Will the weight of these five crates be more or less than the maximum truck load? By how much? Less 1264 kilograms

7. John is employed by a car parts manufacturer. He estimated that with a few minor changes the company should produce 4200 door handles in one week. The changes are made, and two months later a count is taken. On Monday, the department makes 792 door handles; on Tuesday, 815; on Wednesday, 822; on Thursday, 796; on Friday, 818. How many more door handles must the company make in order to reach John's estimate? **157**
8. The Speedster Bicycle Company is offering a prize to the salesman who sells the most bicycles in a month. The sales are tabulated each week. The results at the end of the third week are as follows:

	1st week's sales	2nd week's sales	3rd week's sales
Paul Caron	435	289	384
George Stone	361	428	465
Michael Farewell	377	369	428

Which salesman is in the lead at the end of the third week? How many more bicycles has he sold than the salesman in second place? How many more than the salesman in last place? **Stone 80 146**

CHECK YOUR PROGRESS

Find these differences.

1. $\begin{array}{r} 8 \\ - 3 \\ \hline 5 \end{array}$
2. $\begin{array}{r} 9 \\ - 6 \\ \hline 3 \end{array}$
3. $\begin{array}{r} 14 \\ - 8 \\ \hline 6 \end{array}$
4. $\begin{array}{r} 13 \\ - 9 \\ \hline 4 \end{array}$
5. $\begin{array}{r} 17 \\ - 11 \\ \hline 6 \end{array}$
6. $\begin{array}{r} 4703 \\ - 41 \\ \hline 4662 \end{array}$
7. $\begin{array}{r} 8366 \\ - 158 \\ \hline 8208 \end{array}$
8. $\begin{array}{r} 488 \\ - 391 \\ \hline 97 \end{array}$
9. $\begin{array}{r} 1228 \\ - 453 \\ \hline 775 \end{array}$
10. $\begin{array}{r} 9901 \\ - 4938 \\ \hline 4963 \end{array}$
11. $\begin{array}{r} 6650 \\ - 4149 \\ \hline 2501 \end{array}$
12. $\begin{array}{r} 81\ 006 \\ - 8376 \\ \hline 72\ 630 \end{array}$
13. $\begin{array}{r} 21\ 374 \\ - 2483 \\ \hline 18\ 891 \end{array}$
14. $\begin{array}{r} 25\ 664 \\ - 19\ 053 \\ \hline 6591 \end{array}$
15. $\begin{array}{r} 66\ 053 \\ - 56\ 997 \\ \hline 9056 \end{array}$

Complete this stockroom inventory report by subtracting horizontally.

Item	On Hand		Sent to Department
	Beginning of week	End of week	
Hammers	148	72	(16) 76
Wrenches	65	49	(17) 16
Pliers	83	58	(18) 25
Screw Drivers	135	67	(19) 68
Saws	114	55	(20) 59

65

MULTIPLICATION OF WHOLE NUMBERS

CHAPTER 3

LOWES MANUFACTURING CORPORATION

11 Eastbourne Road, Regina, Saskatchewan

Harwell Office Supplies

4927 14th. Street

Edmonton, Alberta

PURCHASE ORDER NO. C 16522

THIS ORDER NUMBER MUST
APPEAR ON ALL INVOICES,
PACKING LISTS, PACKAGES
AND CORRESPONDENCE

SHIP TO ABOVE ADDRESS UNLESS
OTHERWISE SPECIFIED BELOW

DATE WRITTEN 5/3/76	DELIVERY DATE 22/3/76	SHIP VIA 4th. Class Mail	F.O.B. POINT Edmonton	TERMS 30 days net	ORDERED BY R. Josephson	
QUANTITY	NUMBER		DESCRIPTION		PRICE	EXTENSION
6 boxes	XD 357624		tablets (yellow, unlined)		\$2.70	\$16.20
10 boxes	VD 778740		tablets (white, lined)		3.05	30.50
8 boxes	C 486663		carbon paper		4.25	34.00
24 boxes	GT 422476		4-carbon memos		2.15	51.60
5 boxes	HT 975526		6-carbon memos		5.23	26.15
4 boxes	F 9886		paper clips		1.10	4.40

INSTRUCTIONS

1. INVOICE IN TRIPLICATE.
2. NOTIFY PROMPTLY OF ANY DELAY IN MEETING DELIVERY DATE.
3. PACKING LIST MUST ACCOMPANY ALL SHIPMENTS.

AUTHORIZED BY

When one company wishes to buy materials from another company, a purchase order is used. Here, Lowes Manufacturing Corporation is ordering various office supplies from Harwell Office Supplies. The purchase order number, 16 522, helps both companies keep track

of the order until all aspects of the sale are completed. The amount in the extension column is found by multiplying the quantity by the unit price for that item. The total of the amounts in the "extension" column is the total amount of the order.

PRE-TESTS

Multiply.

1. $\begin{array}{r} 12 \\ 12 \end{array}$
2. $\begin{array}{r} 7 \\ 9 \end{array}$
3. $\begin{array}{r} 10 \\ 4 \end{array}$
4. $\begin{array}{r} 9 \\ 6 \end{array}$
5. $\begin{array}{r} 5 \\ 3 \end{array}$
- a

Multiply.

1. $\begin{array}{r} 33 \\ 49 \end{array}$
2. $\begin{array}{r} 412 \\ 67 \end{array}$
3. $\begin{array}{r} 838 \\ 52 \end{array}$
4. $\begin{array}{r} 397 \\ 406 \end{array}$
5. $\begin{array}{r} 4955 \\ 819 \end{array}$
- b

1. Does $561 \times 36 = 36 \times 561$?

Multiply. Check your answers.

2. $\begin{array}{r} 199 \\ 68 \end{array}$
3. $\begin{array}{r} 475 \\ 305 \end{array}$
4. $\begin{array}{r} 278 \\ 610 \end{array}$
5. $\begin{array}{r} 556 \\ 816 \end{array}$
- c

Estimate the number of digits in the products. Then multiply and check your answers.

1. 89×36
2. 218×636
3. 938×4362
4. 7554×3102
- d

ANSWERS
(a) 1. 144 2. 63 3. 40 4. 54 5. 15 (b) 1. 1617 2. 27 604 3. 43 576 4. 161 182 5. 4 058 145
(c) 1. Yes 2. 13 532 3. 144 875 4. 169 580 5. 453 696 (d) 1. 3204 2. 138 648 3. 4 091 556 4. 23 432 508

3a / FUNDAMENTAL CONCEPTS

Consider this problem in addition.

$$4 + 4 + 4 + 4 + 4 = 20$$

And the same problem in multiplication.

$$5 \times 4 = 20$$



Multiplication is repeated addition.

Since it is usually quicker to multiply than to add, you must learn to use multiplication effectively. To do so, you should know the basic multiplication combinations and be able to recall them almost without thinking. Everyone should learn all the combinations through 9×9 . However, if you learn all the combinations through 12×12 , you will improve your computational skill.

For students to recognize commutativity of multiplication, you could have the students make a table like this one below. Soon one or more students will recognize the diagonal divides equal sides of the table. Then they can see that $6 \times 7 = 7 \times 6$ and so on.

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

table 3.1
Multiplication



We get the same answer regardless of the order in which the numbers are multiplied.

$$9 \times 6 = 6 \times 9$$

EXERCISES Find these products by inspection as quickly as you can.

- | | | | | |
|----------------------|----------------------|----------------------|------------------------|----------------------|
| 1. 9×6 54 | 2. 4×7 28 | 3. 3×8 24 | 4. 7×8 56 | 5. 2×6 12 |
| 6. 5×5 25 | 7. 7×9 63 | 8. 6×3 18 | 9. 9×9 81 | 10. 6×7 42 |
| 11. 6×11 66 | 12. 4×12 48 | 13. 12×8 96 | 14. 11×11 121 | 15. 7×12 84 |

3 b / MULTIPLICATION TECHNIQUES

In multiplying larger numbers, the product is found as shown in the following example.

EXAMPLE

Multiply: 37×269

We can think of this as two problems.

$$37 \times 269 = (7 \times 269) + (30 \times 269)$$

To multiply 7×269 , think

$$7 \times 9 = 63 \text{ (Record 3 and carry 6)}$$

$$7 \times 6 = 42$$

$$+ \underline{6} \text{ (Carried)}$$

$$48 \text{ (Record 8 and carry 4)}$$

$$7 \times 2 = 14$$

$$+ \underline{4} \text{ (Carried)}$$

$$18 \text{ (Record 18)}$$

■ So, $7 \times 269 = 1883$

To multiply 3×269 , think

$$3 \times 9 = 27 \text{ (Record 7 and carry 2)}$$

$$3 \times 6 = 18$$

$$+ \underline{2} \text{ (Carried)}$$

$$20 \text{ (Record 0 and carry 2)}$$

$$3 \times 2 = 6$$

$$+ \underline{2} \text{ (Carried)}$$

$$8 \text{ (Record 8)}$$

■ So, $3 \times 269 = 807$ and $30 \times 269 = 8070$

So, we can combine the answers and record the results as follows:

$$\begin{array}{r} 269 \\ \times 37 \\ \hline 1883 \\ 8070 \\ \hline 9953 \end{array}$$

Be sure to align the digits correctly.



EXERCISES

Multiply.

1. $\begin{array}{r} 37 \\ 28 \\ \hline 1036 \end{array}$

2. $\begin{array}{r} 69 \\ 54 \\ \hline 3726 \end{array}$

3. $\begin{array}{r} 286 \\ 31 \\ \hline 8866 \end{array}$

4. $\begin{array}{r} 419 \\ 67 \\ \hline 28073 \end{array}$

5. $\begin{array}{r} 621 \\ 89 \\ \hline 55269 \end{array}$

6. $\begin{array}{r} 713 \\ 428 \\ \hline 305164 \end{array}$

7. $\begin{array}{r} 825 \\ 214 \\ \hline 176550 \end{array}$

8. $\begin{array}{r} 920 \\ 29 \\ \hline 26680 \end{array}$

9. $\begin{array}{r} 1015 \\ 36 \\ \hline 36540 \end{array}$

10. $\begin{array}{r} 1224 \\ 153 \\ \hline 187272 \end{array}$

11. $\begin{array}{r} 1376 \\ 137 \\ \hline 188512 \end{array}$

12. $\begin{array}{r} 1510 \\ 103 \\ \hline 155530 \end{array}$

3 C / CHECKING THE ACCURACY OF PRODUCTS

The best way to check your answer in a multiplication problem is to reverse the factors and multiply again. You should get the same answer.



We get the same answer regardless of the order in which numbers are multiplied.

$$8 \times 4 = 4 \times 8 = 32$$

EXAMPLE

Multiply: 432×186

$$\begin{array}{r} 432 \\ 186 \\ \hline 2592 \\ 3456 \\ 432 \\ \hline 80352 \end{array}$$

$$\begin{array}{r} \text{Check: } 186 \\ 432 \\ \hline 372 \\ 558 \\ 744 \\ \hline 80352 \end{array}$$

← Check →

EXAMPLE

Multiply: 705×810

$$\begin{array}{r} 705 \\ 810 \\ \hline 000 \\ 705 \\ \hline 5640 \\ 571050 \end{array}$$

$$\begin{array}{r} \text{Check: } 810 \\ 705 \\ \hline 4050 \\ 000 \\ \hline 5670 \\ 571050 \end{array}$$

← Check →

You can also check your answer by casting out nines.

EXAMPLE

Multiply: 348×841

$$\begin{array}{r} 348 \\ 841 \\ \hline 348 \\ 1392 \\ 2784 \\ \hline 292668 \end{array}$$

$$\begin{array}{l} 348 \quad 3 + 4 + 8 = 15 \rightarrow 1 + 5 = 6 \\ 841 \quad 8 + 4 + 1 = 13 \rightarrow 1 + 3 = 4 \end{array} \left. \vphantom{\begin{array}{l} 348 \\ 841 \end{array}} \right\} 6 \times 4 = 24 \rightarrow 2 + 4 = \textcircled{6}$$

$$2 + 9 + 2 + 6 + 6 + 8 = 33 \rightarrow 3 + 3 = \textcircled{6}$$

Check

EXERCISES Multiply. Check your answers.

1. 871×223 194 233

2. 43×17 731

3. 590×335 197 650

4. 78×92 7176

5. 846×65 54 990

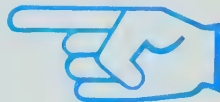
6. 804×21 16 884

3 d / ESTIMATING ANSWERS

Estimating answers helps to prevent clerical errors, such as lining up a column of digits incorrectly. Suppose you multiply 7×1246 and get an answer that has 5 digits, such as 87 202. It is obviously wrong because $7 \times 1200 = 8400$, thus you know your answer must be a four-digit number, close to 8400.

Rounding factors is considered a good check for reasonableness.

Estimating answers is based on good judgment.



To estimate an answer in a multiplication problem, first round the factors. Then multiply these rounded factors. The product is an estimate of the original problem.

EXAMPLE

Estimate the number of digits in the product of 41×98 .

First round 41 to 40.

Then round 98 to 100.

$40 \times 100 = 4000$ (a four-digit number)

$41 \times 98 = 4018$ (a four-digit number)

Any three- or five-digit number would obviously be incorrect.

EXAMPLE

Estimate the number of digits in the product 631×786 .

First round 631 to 600.

Then round 786 to 800.

$600 \times 800 = 480\,000$ (a six-digit number)

$631 \times 786 = 495\,966$ (a six-digit number)

Any five- or seven-digit number would be incorrect.

EXERCISES Estimate the number of digits in the products. Then multiply to see if your estimates are correct. Check your answers.

1. 57×83 4731

2. 112×23 2576

3. 225×961 216 225

4. 316×272 85 952

5. 112×5832 653 184

6. 2314×6215 14 381 510

REVIEW / MULTIPLICATION OF WHOLE NUMBERS

MIXED PROBLEMS

Multiply.

1. $6 \times 7 = 7 \times 6 = \underline{42}$
2. $8 \times 4 = 4 \times 8 = \underline{32}$
3. $2 \times 11 = 11 \times 2 = \underline{22}$
4. $5 \times 9 = 9 \times 5 = \underline{45}$
5. $3 \times 9 = 9 \times 3 = \underline{27}$
6. $10 \times 6 = 6 \times 10 = \underline{60}$

Find the missing values.

$$7. 63 \times 48 = (\underline{3} \times 48) + (\underline{60} \times 48)$$

$$\begin{array}{r} 48 \\ \times 3 \\ \hline 144 \end{array} \qquad \begin{array}{r} 48 \\ \times 60 \\ \hline 2880 \end{array}$$

$$63 \times 48 = (3 \times \underline{48}) + (60 \times \underline{48})$$

$$= \underline{144} + \underline{2880} = \underline{3024}$$

$$8. 34 \times 225 = (\underline{4} \times 225) + (\underline{30} \times 225)$$

$$\begin{array}{r} 225 \\ \times 4 \\ \hline 900 \end{array} \qquad \begin{array}{r} 225 \\ \times 30 \\ \hline 6750 \end{array}$$

$$34 \times 225 = (4 \times \underline{225}) + (30 \times \underline{225})$$

$$= \underline{900} + \underline{6750} = \underline{7650}$$

Round each two-digit factor to the nearest ten; round each three-digit factor to the nearest hundred. Then multiply the rounded factors.

9. 48×61 **3000**
10. 76×94 **7200**
11. 78×469 **40 000**
12. 252×73 **21 000**

Multiply.

13. 48×61 **2928**
14. 76×94 **7144**
15. 78×469 **36 582**
16. 252×73 **18 396**

Multiply.

17. 418
 18. 165
 19. 325
 20. 909
- $$\begin{array}{r} 173 \\ \hline 72\ 314 \end{array} \qquad \begin{array}{r} 747 \\ \hline 123\ 255 \end{array} \qquad \begin{array}{r} 806 \\ \hline 261\ 950 \end{array} \qquad \begin{array}{r} 419 \\ \hline 380\ 871 \end{array}$$

WORD PROBLEMS

1. The Ajax Canning Company received a large order from Thomas and Sons to be filled in two weeks. The manager of the packaging department wanted to find out how long it would take to fill the order. He knew the number of cases each of his employees could pack in one hour.

Employee	Number of cases per hour	Number of cases per day	Number of cases per week
Gerrard	72	8×72 576	40×72 2880
Hilda	68	8×68 544	40×68 2720
Tony	75	8×75 600	40×75 3000
Maria	83	8×83 664	40×83 3320
Marilyn	79	8×79 632	40×79 3160

How many cases could each employee pack in one eight-hour day? In one five-day week? If the Thomas and Sons order is for 21 100 cases, how many days should the manager allow to fill it? **7**

2. The Porter Company owns a large building and rents office space to various companies. Each office in the building is 20 metres long and 12 metres wide. If there are 65 of these offices in the building, how many square metres are available for rental? (length $\times$ width = area) **15 600 square metres**
3. Joe's truck has a maximum load of 15 876 kilograms. He has two large shipments to make and is worried that they will both be too heavy. One shipment consists of 65 crates, each weighing 244 kilograms. The other shipment is 720 boxes, each weighing 22 kilograms. What is the total weight of the first shipment? What is the total weight of the second shipment? Does either shipment weigh more than the maximum load for Joe's truck? **15 860 kg; 15 840 kg; no**
4. (a) Sandi buys gas for her car two times a week. She buys 77 litres each time. How many litres of gas does she buy in one week? In four weeks? **154 litres; 616 litres**
- (b) If Sandi drives 20 kilometres on 4 litres of gas, how many kilometres does she drive in one week? In four weeks? **770 kilometres; 3080 kilometres**

5. Marquette Printing Company sends bills each month for the jobs they have completed. There are seven people in the billing department to type and file bills, compute discounts, and stuff, stamp, and seal envelopes.

	Employee	Type of Work	Average Rate an Hour
1390	Mulligan	typing bills	58
1584	Northrup	typing bills	66
4248	O'Brien	computing discounts	177
7032	Parsons	stuffing envelopes	293
3192	Rivera	filing bills	133
12 960	Simpson	stamping envelopes	540
18 408	Tannenbaum	sealing envelopes	767

How many bills can be typed in 35 hours? How much work can be done by each employee in 24 hours.

6. (a) The Fabric House, a discount fabric store, mails advertising circulars each month to their prospective customers. Judy addresses the circulars by sticking printed labels on each circular. She does

14 circulars a minute. How many can she address in 4 hours? 3360

- (b) The company is considering purchasing a machine which can stick the labels on the circulars six times as fast as Judy can. How many circulars could the machine address in 4 hours? 20 160

CHECK YOUR PROGRESS

Multiply.

1. 11	2. 8	3. 12	4. 9	5. 6
11	7	2	4	5
121	56	24	36	30
6. 81	7. 43	8. 98	9. 303	10. 578
36	70	67	12	60
2916	3010	6566	3636	34 680
11. 704	12. 385	13. 691	14. 272	15. 555
99	806	423	938	703
69 696	310 310	292 293	255 136	390 165

Estimate the number of digits in the products. Then multiply. Check your answers.

16. 33	17. 508	18. 442	19. 8064	20. 9309
95	71	698	677	1746
3135	36 068	308 516	5 459 328	16 253 514

45

DIVISION OF WHOLE NUMBERS

CHAPTER 4

WEEK ENDING <i>June 22 1976</i>		PREPARED BY <i>L. Sanders</i>				
		MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
FURNITURE POLISH	PER DAY	832	1200	880	1224	1448
	PER HOUR	104	150	110	153	181
FURNITURE CLEANER	PER DAY	648	728	632	752	720
	PER HOUR	81	91	79	94	90
WAX REMOVER	PER DAY	736	760	792	696	808
	PER HOUR	92	95	99	87	101
FLOOR WAX	PER DAY	1392	816	936	1144	1528
	PER HOUR	174	102	117	143	191
TILE AND GROUT CLEANER	PER DAY	424	456	448	480	552
	PER HOUR	53	57	56	60	69
ALL-PURPOSE CLEANER	PER DAY	1424	1456	1656	1728	1552
	PER HOUR	178	182	207	216	194

This production report is simply a statement of the number of items manufactured. It not only tells how much merchandise is ready for sale, but also provides the managers of the business a way of analyzing the efficien-

cy of the company and the effect of different workloads or employee absences. This company divides each daily total by eight, the number of working hours, to obtain an average which is easier for them to use.

PRE-TESTS

Find the missing values.

- 1. $36 \div 4 = \underline{\hspace{1cm}}$ because $\underline{\hspace{1cm}} \times 4 = 36$
- 2. $84 \div 7 = \underline{\hspace{1cm}}$ because $\underline{\hspace{1cm}} \times 7 = 84$
- 3. $56 \div 8 = \underline{\hspace{1cm}}$ because $\underline{\hspace{1cm}} \times 8 = 56$
- 4. $44 \div 4 = \underline{\hspace{1cm}}$ because $\underline{\hspace{1cm}} \times 4 = 44$
- 5. $18 \div 3 = \underline{\hspace{1cm}}$ because $\underline{\hspace{1cm}} \times 3 = 18$

a

Find these quotients.

- 1. $976 \div 61$
 - 2. $6720 \div 96$
 - 3. $9506 \div 98$
- Divide by repeated subtraction.
- 4. $1405 \div 281$
 - 5. $4312 \div 616$
 - 6. $3496 \div 437$

b

Divide these numbers first by 10, then by 100.

- 1. 4328
 - 2. 6599
 - 3. 86 437
- Divide these numbers by 50.
- 4. 9800
 - 5. 7650
 - 6. 297 100
- Divide these numbers by 25.
- 7. 6300
 - 8. 4950
 - 9. 72 650

c

Estimate the number of digits in these quotients. Divide. Check your answers by multiplying.

- 1. $8245 \div 85$
- 2. $9345 \div 51$
- 3. $24\ 156 \div 732$
- 4. $143\ 115 \div 145$

Find the average.

- 5. 143, 762, 603, 645, 679, 594
- 6. 88, 97, 62, 76, 83, 85, 90
- 7. 365, 388, 409, 415, 340, 326, 399, 422
- 8. 481, 506, 512, 494, 491, 508, 515

d

ANSWERS (a) 1. 9.9 2. 12.12 3. 7.7 4. 11.11 5. 6.6 (b) 1. 16 2. 70 3. 97 4. 5 5. 7 6. 8 (c) 1. 432.8, 43.28 2. 659.966, 99 3. 8647.7, 864.37 4. 196 5. 153 6. 5942 7. 252 8. 198 9. 2906 (d) 1. 97 2. 185 3. 33 4. 987 5. 571 6. 83 7. 383 8. 501

183 r 12

4 a / FUNDAMENTAL CONCEPTS

Although division is the inverse of multiplication, unlike multiplication it is not commutative. Thus $36 \div 9 \neq 9 \div 36$.

Just as subtraction is the reverse of addition, division is the reverse of multiplication. Twenty divided by five equals four because four times five equals twenty. Also, just as multiplication is repeated addition, division is repeated subtraction. Simply stated, division is the process of finding how many times one number is contained in another. For example, the number 5 is contained in the number 20, 4 times, or 20 divided by 5 is 4.



In division, the number to be divided is the *dividend*, the number by which the dividend is divided is the *divisor*, and the answer is the *quotient*.

EXAMPLE

Divide: 36 by 9

$$\begin{array}{r} \text{Divisor} \longrightarrow 9 \overline{)36} \\ \underline{36} \\ 0 \end{array}$$

4 ← Quotient
36 ← Dividend
0 ← Remainder



A quotient is correct if the product of the quotient and the divisor equals the dividend.

$$\begin{aligned} 36 \div 9 &= \boxed{4} \text{ because } \boxed{4} \times 9 = 36 \\ 48 \div 8 &= \boxed{6} \text{ because } \boxed{6} \times 8 = 48 \end{aligned}$$

EXERCISES Find the missing values.

1. $54 \div 6 = \underline{\quad 9 \quad}$ because $\underline{\quad 9 \quad} \times 6 = 54$

3. $72 \div 6 = \underline{\quad 12 \quad}$ because $\underline{\quad 12 \quad} \times 6 = 72$

5. $18 \div 9 = \underline{\quad 2 \quad}$ because $\underline{\quad 2 \quad} \times 9 = 18$

7. $21 \div 7 = \underline{\quad 3 \quad}$ because $\underline{\quad 3 \quad} \times 7 = 21$

9. $24 \div 3 = \underline{\quad 8 \quad}$ because $\underline{\quad 8 \quad} \times 3 = 24$

2. $88 \div 8 = \underline{\quad 11 \quad}$ because $\underline{\quad 11 \quad} \times 8 = 88$

4. $96 \div 12 = \underline{\quad 8 \quad}$ because $\underline{\quad 8 \quad} \times 12 = 96$

6. $28 \div 4 = \underline{\quad 7 \quad}$ because $\underline{\quad 7 \quad} \times 4 = 28$

8. $35 \div 5 = \underline{\quad 7 \quad}$ because $\underline{\quad 7 \quad} \times 5 = 35$

10. $110 \div 10 = \underline{\quad 11 \quad}$ because $\underline{\quad 11 \quad} \times 10 = 110$

4 b / DIVISION TECHNIQUES

Suppose we want to divide 512 by 16. We first want to find out how many times 16 is contained in 51. If we estimate that 16 is contained in 51 two times, we find that our estimate is too small. The difference between 51 and 32 (the product of 16×2) is 19, and 19 contains another 16. If we estimate that 16 is contained in 51 four times, we find that our estimate is too large. The product 4×16 is 64, and 64 is more than 51. By trial and error or by good guessing (estimating), we find that 16 is contained in 51 three times with a remainder of 3.

Now we can find how many times 16 is contained in 512. 16 is contained 30 times in 512, and by writing the 3 over the 1, it has the place value 30. Then we divide 32 by 16.

$$\begin{array}{r}
 32 \leftarrow 3 \text{ in tens place has value } 30 \\
 16 \overline{)512} \\
 \underline{480} \\
 32 \\
 \underline{32} \\
 0 \leftarrow \text{Remainder}
 \end{array}$$

That is, $(30 \times 16) + (2 \times 16) = 32 \times 16 = 512$.

We can also divide using repeated subtraction.

EXAMPLE

Divide 105 by 35. The answer is the number of times 35 is subtracted.

$$\begin{array}{r}
 105 \\
 - 35 \text{ (1)} \\
 \hline
 70 \\
 - 35 \text{ (2)} \\
 \hline
 35 \\
 - 35 \text{ (3)} \\
 \hline
 0
 \end{array}
 \quad 105 \div 35 = 3 \quad \text{Check: } 3 \times 35 = 105$$

Point out that most calculators divide by repeated subtraction.

EXERCISES Find these quotients.

- | | | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| 1. $952 \div 34$ 28 | 2. $231 \div 11$ 21 | 3. $975 \div 25$ 39 | 4. $994 \div 14$ 71 |
| 5. $975 \div 39$ 25 | 6. $1463 \div 77$ 19 | 7. $2385 \div 45$ 53 | 8. $1218 \div 14$ 87 |
| 9. $1422 \div 18$ 79 | 10. $7298 \div 89$ 82 | 11. $3036 \div 46$ 66 | 12. $3213 \div 63$ 51 |
| 13. $7847 \div 413$ 19 | 14. $8320 \div 260$ 32 | 15. $13\,532 \div 68$ 199 | 16. $44\,100 \div 84$ 525 |
| 17. $11\,919 \div 87$ 137 | 18. $10\,245 \div 15$ 683 | 19. $18\,300 \div 75$ 244 | 20. $29\,248 \div 64$ 457 |

Divide by repeated subtraction.

- | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 21. $378 \div 126$ 3 | 22. $876 \div 219$ 4 | 23. $3402 \div 378$ 9 | 24. $1872 \div 624$ 3 |
| 25. $1638 \div 819$ 2 | 26. $4860 \div 972$ 5 | 27. $5112 \div 852$ 6 | 28. $5560 \div 695$ 8 |

4 C / SHORT CUTS IN DIVISION

To multiply a number by 10, simply add a 0: $567 \times 10 = 5670$.
To divide a number by 10, think of it in decimal form, and divide simply by moving the decimal point one position to the left.

EXAMPLES

Divide: 46 730 by 10

Think: $46\ 730 = 46\ 730$.

Then, $46\ 730 \div 10 = 4673.0$

Divide: 349 by 10

Think: $349 = 349$.

Then, $349 \div 10 = 34.9$



To divide by 100, move the decimal point two places to the left; to divide by 1000, move the decimal point three places to the left; and so on.

Since 50 is half as much as 100, we can divide by 50 simply by dividing by 100 and multiplying the result by 2.

EXAMPLE

Divide: 2150 by 50

Divide by 100: $2150 \div 100 = 21.50$

Multiply the result by 2: $21.50 \times 2 = 43$

■ Therefore, $2150 \div 50 = 43$

Similarly, since 100 is four times as much as 25, we can divide by 25 simply by dividing by 100 and multiplying the result by 4.

EXAMPLE

Divide: 3200 by 25

$3200 \div 100 = 32$

$32 \times 4 = 128$

■ Therefore, $3200 \div 25 = 128$

EXERCISES Divide these numbers first by 10, then by 100.

- | | | | |
|--|--|--|--|
| 1. 5440 544 ; 54.4 | 2. 2310 231 ; 23.1 | 3. 5130 513 ; 51.3 | 4. 6210 621 ; 62.1 |
| 5. 6218 621.8 ; 62.18 | 6. 9700 970 ; 97 | 7. 6519 651.9 ; 65.19 | 8. 8772 877.2 ; 87.72 |
| 9. 1026 102.6 ; 10.26 | 10. 5503 550.3 ; 55.03 | 11. 8399 839.9 ; 83.99 | 12. 17 724 1772.4 ; 177.24 |
| 13. 86 515 8651.5 ; 865.15 | 14. 44 912 4491.2 ; 449.12 | 15. 33 969 3396.9 ; 339.69 | |

Divide these numbers by 50, using the short cut above.

- | | | | | |
|---------------------|-----------------------|-----------------------|-------------------------|---------------------------|
| 16. 900 18 | 17. 1700 34 | 18. 4800 96 | 19. 850 17 | 20. 2750 55 |
| 21. 8550 171 | 22. 10 500 210 | 23. 15 000 300 | 24. 186 300 3726 | 25. 552 350 11 047 |

Divide these numbers by 25, using the short cut above.

- | | | | | |
|---------------------|---------------------|---------------------|---------------------|------------------------|
| 26. 400 16 | 27. 700 28 | 28. 900 36 | 29. 1800 72 | 30. 3600 144 |
| 31. 4500 180 | 32. 5300 212 | 33. 6250 250 | 34. 7450 298 | 35. 29 700 1188 |

4 d / ESTIMATION AND FINDING AVERAGES

We estimated our answers in multiplication by finding the number of digits in the product. We can use the same method to estimate whether the number of digits in a quotient is reasonable.

EXAMPLE

Estimate the number of digits in the quotient $40\,488 \div 723$.

Round 723 to 700.

$700 \times 10 = 7000$ (smaller than 40 488)

$700 \times 1000 = 70\,000$ (larger than 40 488)

Since 40 488 is between 7000 and 70 000, the quotient must be between 10 and 100.

- Therefore, there are two digits in the quotient.

This technique is especially useful in decimal problems. For example, $420.61 \div 41.46 \approx 400 \div 40 \approx 10$, which means there will be two digits before the decimal point in the answer. Mention this technique when the class studies Chapter 6.

Check: $40\,488 \div 723 = 56$

We can use division to find an average.

$$\text{Average} = \frac{\text{Sum of measures}}{\text{Number of measures}}$$

EXAMPLE

Constance scored 82, 84, 76, 90, 75, 83, 89, 77, and 91 on her examinations for the year. What was her average score?

Find the sum of the scores.

$$82 + 84 + 76 + 90 + 75 + 83 + 89 + 77 + 91 = 747$$

Divide the sum by the number of examinations.

$$747 \div 9 = 83$$

- Her average score was 83.

EXERCISES Estimate the number of digits in these quotients. Then divide.

1. $1334 \div 58$ 23

2. $5307 \div 87$ 61

3. $2244 \div 51$ 44

4. $1148 \div 82$ 14

5. $5310 \div 85$ 62 R. 40

6. $34\,730 \div 755$ 46

7. $59\,472 \div 826$ 72

8. $353\,325 \div 673$ 525

Find the average masses for each of the following shipments. The masses are in kilograms.

9. 175, 143, 97, 168, 153, 122 143

10. 44, 38, 59, 42, 67, 25, 31, 78 48

11. 279, 236, 258, 244, 211, 225, 234 241

12. 936, 450, 683, 842, 394 661

REVIEW / DIVISION OF WHOLE NUMBERS

MIXED PROBLEMS

Find these quotients.

- Six thousand three hundred ninety-nine divided by seven hundred eleven **9**
- Ten thousand two hundred twenty-four divided by eight hundred fifty-two **12**
- One hundred ninety-four thousand three hundred twelve divided by eight hundred fifty-six. **227**

Find the missing values.

$$\begin{array}{r}
 4. \quad 294 \\
 - 49 \\
 \hline
 245 \\
 - 49 \\
 \hline
 196 \\
 - 49 \\
 \hline
 147 \\
 - 49 \\
 \hline
 98 \\
 - 49 \\
 \hline
 49 \\
 - 49 \\
 \hline
 0
 \end{array}$$

$$294 \div 49 = \underline{6} \text{ remainder } \underline{4}$$

$$\text{Check: } (49 \times \underline{6}) + \underline{4} = 294$$

$$\begin{array}{r}
 5. \quad 643 \\
 - 138 \\
 \hline
 505 \\
 - 138 \\
 \hline
 367 \\
 - 138 \\
 \hline
 229 \\
 - 138 \\
 \hline
 91
 \end{array}$$

$$643 \div 138 = \underline{4} \text{ remainder } \underline{91}$$

$$\text{Check: } (138 \times \underline{4}) + \underline{91} = 643$$

Find these quotients.

- $1320 \div 44$ **30**
- $3402 \div 21$ **162**
- $47\,836 \div 100$ **478.36**
- $9820 \div 50$ **196.4**
- $3650 \div 50$ **73**
- $759\,200 \div 25$ **30\,368**

Estimate the number of digits in each quotient; then divide.

- $6324 \div 68$ **93**
- $10\,332 \div 84$ **123**
- $21\,518 \div 406$ **53**
- $497\,568 \div 5183$ **96**

Find the average.

- 56, 44, 38, 49, 55, 47, 53, 50 **49**
- 176, 190, 193, 201, 216, 209, 194 **197**
- 99, 246, 309, 279, 253, 96, 188 **210**
- 657, 642, 654, 649, 648, 656 **651**
- Subtract 640 from each of these numbers. Then find the average of the differences. **11** Add this average to 640. Is this the average of the original numbers? 657, 642, 654, 649, 648, 656 **yes**
17 2 14 16

WORD PROBLEMS

- Jeannine drives daily from her home in the suburbs of St. John's to work. If she lives 20 kilometres from her office and does not use her car for other pleasure driving and works five days a week, how many kilometres does she drive in a week? **200 kilometres**
 - Jeannine usually buys gas once a week—buying 45 litres each time. How many kilometres can she get to one litre of gas? **4.4 kilometres**
 - By using her father's four-cylinder import car for one month, Jeannine found that she had to buy gas only once a week. If this weekly purchase was for only 24 litres of gas, how many kilometres can she get to one litre of gas with the smaller car? **8.33 kilometres**
- The Campbellville Daily Gazette decided to conduct a telephone survey before the next local election. They wanted to find out which candidates were most likely to be elected. Each caller could contact 35 voters a day. If there are 4410 registered voters in Campbellville, how many days will it take one person to complete the survey? If the newspaper has 7 people telephoning, how many days will it take to complete the survey? If the 7 people work 6 days a week, how many weeks will it take? **126 18 3**
- Brent works in the office of the Production Manager of a Halifax Cereal Company whose main product is a dehydrated grain cereal sold as a pet food. Brent records the number of packages produced each week. One week the production manager reported that 1200 kilograms of pet food were manufactured on Monday, 1700 kilograms on Tues-

day, 1852 kilograms on Wednesday, 1356 kilograms on Thursday, and 1672 kilograms on Friday. How many 800-gram packages of pet food were produced each day? (1000 grams = 1 kilogram) How many for the week? If the company used 1333-gram packages, how many would be produced each day? How many for the week?

4. Cindy took a week to drive on the Trans-Canada Highway. She drove 365 kilometres the first day, 381 kilometres the second day, 374 kilometres the third day, 426 kilometres the fourth day, 439 kilometres the fifth day, 472 kilometres the sixth day, and 378 kilometres the last day. How many kilometres did she average a day? **405**
5. Davidson & Sons purchases eggs from various farmers and then repackages them in their own cartons for retail sale. They made these purchases:

NUMBER OF CASES	EGGS IN ONE CASE	TOTAL EGGS	NUMBER OF CARTONS
7	288	2016	168
9	324	2916	243
12	240	2880	240
15	180	2700	225
10	360	3600	300
6	432	2592	216

How many eggs did they purchase? How many cartons (12 eggs to a carton) can be prepared from these purchases? **16 704; 1392**

6. Henry Clark's Transport Trucks carry a maximum load of 8900 kilograms. They have a large shipment of Florida oranges to drive to Canada and need to

know how many trucks they will need. He weighs 7 of the crates of oranges and records each weight: 24 kilograms, 25 kilograms, 29 kilograms, 26 kilograms, 21 kilograms, 23 kilograms, and 27 kilograms. What is the average weight of a crate? How many crates can he load on one truck? If there are 4272 crates to be shipped, how many trucks will he need?

25 kilograms; 356 crates; 12 trucks

CHECK YOUR PROGRESS

Find the missing values.

1. $63 \div 7 = \underline{9}$ because $\underline{9} \times 7 = 63$
2. $42 \div 6 = \underline{7}$ because $\underline{7} \times 6 = 42$
3. $108 \div 9 = \underline{12}$ because $\underline{12} \times 9 = 108$

Find these quotients.

4. $2277 \div 23$ **99**
5. $7381 \div 671$ **11**
6. $11\ 340 \div 84$ **135**

Divide by repeated subtraction.

7. $3460 \div 692$ **5**
8. $1266 \div 211$ **6**
9. $3759 \div 537$ **7**

Divide.

10. $49\ 362 \div 100$ **493.62**
11. $5390 \div 10$ **539**
12. $480 \div 50$ **9.6**
13. $76\ 950 \div 50$ **1539**
14. $8100 \div 25$ **324**
15. $394\ 600 \div 25$ **15 784**

Estimate the number of digits in these quotients. Then divide.

16. $3978 \div 51$ **78**
17. $11\ 972 \div 73$ **164**
18. $47\ 376 \div 329$ **144**

Find the average.

19. 177, 365, 348, 359, 401 **330**
20. 186, 193, 174, 185, 180, 191, 172 **183**

Answer to Exercise 3

	800 g	1333 g
Monday	1500	900
Tuesday	2125	1275
Wednesday	2315	1389
Thursday	1695	1017
Friday	2090	1254
	9725	5835

FRACTIONS

25045

SOLD TO WENDERSON ELECTRONICS 7349 SEVENTH ST. CALGARY, ALBERTA		SHIPP TO SAME					
DATE 5/3/76	SHIPP VIA C.N.X.	FED. LICENCE NO.	PROV. LICENCE NO.	YOUR ORDER NO. A4628	OUR ORDER NO.	TERMS Net. 30	SALESMAN 472
BACK ORDER#	QUAN. ORDERED	DESCRIPTION			QUAN. SHIPPED	UNIT PRICE	- AMOUNT
	12 1/2 m	(code * X498) wine			12 1/2 m	0.36	4.50
	4 1/2 m	(code * R038) wine			4 1/2 m	2.94	12.73
	16 box	outlets (code * B265)			16 box	4.28	68.48
TAX TOTAL							4.28 89.97
BACK ORDERED ITEMS WILL BE REORDERED AS STOCKS AVAILABLE UNLESS WE AND OTHERWISE ADVISED R/LA ITEMS ARE NOT AVAILABLE AND HAVE NOT BEEN BACK ORDERED					DATE SHIPPED		SHIPPED SHIPPED

REGFORM 75015E

INVOICE

requesting payment. Notice that the person preparing this invoice must be able to multiply fractions accurately.

PRE-TESTS

Classify these fractions as proper fractions, improper fractions, or mixed numbers.

1. $\frac{7}{12}$
2. $12\frac{3}{11}$
3. $\frac{7}{8}$
4. $1\frac{5}{9}$
5. $\frac{9}{8}$

a

Change these improper fractions to mixed numbers.

1. $\frac{21}{5}$
2. $\frac{33}{7}$
3. $\frac{42}{3}$
4. $\frac{55}{6}$
5. $\frac{62}{11}$

Change these mixed numbers to improper fractions.

6. $2\frac{5}{8}$
7. $4\frac{4}{7}$
8. $6\frac{2}{3}$
9. $5\frac{2}{9}$
10. $9\frac{5}{16}$

b

Reduce these fractions to lowest terms.

11. $\frac{9}{12}$
12. $\frac{10}{24}$
13. $\frac{8}{18}$
14. $\frac{6}{16}$
15. $\frac{21}{30}$

Find the LCD's for these fractions and change each to an equivalent fraction, using the LCD.

1. $\frac{1}{12}, \frac{2}{3}, \frac{3}{4}$
2. $\frac{2}{9}, \frac{1}{6}, \frac{2}{3}$
3. $\frac{3}{8}, \frac{5}{6}, \frac{7}{12}$
4. $\frac{5}{16}, \frac{7}{12}, \frac{9}{24}$

c

Add these fractions.

1. $\frac{7}{8} + \frac{3}{8}$
2. $\frac{5}{9} + \frac{7}{9}$
3. $\frac{17}{18} + \frac{1}{12}$
4. $\frac{13}{60} + \frac{11}{15}$

d

Subtract these fractions.

1. $\frac{15}{23} - \frac{9}{23}$
2. $\frac{17}{25} - \frac{11}{25}$
3. $\frac{2}{9} - \frac{4}{27}$
4. $\frac{5}{6} - \frac{1}{25}$

e

Find these products.

1. $\frac{9}{13} \times \frac{5}{6}$
2. $\frac{3}{4} \times \frac{18}{29}$
3. $\frac{13}{15} \times \frac{8}{31}$
4. $\frac{12}{17} \times \frac{15}{32}$

f

Find these products.

1. $3\frac{5}{8} \times 2\frac{2}{3}$
2. $4\frac{1}{4} \times 5\frac{1}{2}$
3. $8\frac{5}{7} \times 9\frac{3}{5}$
4. $12\frac{1}{6} \times 5\frac{1}{7}$

g

Divide. Reduce answers to lowest terms.

1. $\frac{5}{9} \div \frac{3}{4}$
2. $\frac{7}{15} \div \frac{1}{2}$
3. $2\frac{3}{8} \div \frac{1}{4}$
4. $5\frac{2}{3} \div 8\frac{1}{10}$

h

ANSWERS
(a) 1. improper fraction 2. mixed number 3. proper fraction 4. mixed number 5. improper fraction
(b) 1. $4\frac{1}{5}$ 2. $2\frac{4}{5}$ 3. $14\frac{3}{4}$ 4. $9\frac{1}{6}$ 5. $5\frac{1}{11}$ 6. $\frac{21}{8}$ 7. $\frac{32}{7}$ 8. $\frac{20}{3}$ 9. $\frac{47}{6}$ 10. $\frac{109}{16}$ 11. $12\frac{1}{2}$ 12. $\frac{5}{12}$
(c) 1. LCD=12; $\frac{1}{12}, \frac{2}{3}, \frac{3}{4}$ (d) 1. $\frac{1}{4}, \frac{1}{6}, \frac{2}{3}$ (e) 1. $\frac{9}{23}$ 2. $\frac{5}{23}$ 3. $\frac{20}{24}$ 4. $\frac{62}{24}$ 5. $\frac{20}{27}$
(f) 1. $\frac{15}{26}$ 2. $\frac{27}{58}$ 3. $\frac{104}{465}$ 4. $\frac{45}{136}$ (g) 1. $9\frac{7}{3}$ 2. $23\frac{3}{8}$ 3. $83\frac{2}{35}$ 4. $62\frac{7}{7}$ (h) 1. $\frac{20}{27}$

5 a / FUNDAMENTAL CONCEPTS

A *fraction* is a ratio between two numbers. The two numbers or terms in a fraction are separated by a horizontal line or by a slash.

Ratio is also sometimes called a comparison of two numbers. This concept is discussed in Chapter 7.

$$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}, \frac{8}{9}$$

$$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}, \frac{8}{9}$$

The *denominator* of the fraction is the number below the line or to the right of the slash. It shows into how many equal parts the whole is divided. If an apple pie were cut into 6 equal pieces, one piece would represent $\frac{1}{6}$ of the whole pie. The denominator of the fraction is 6, the number of equal parts.

The *numerator* of the fraction is the number above the line or to the left of the slash. It shows the number of equal parts we are interested in. Consider the fraction $\frac{3}{10}$. The numerator 3 means that we are interested in three $\frac{1}{10}$'s.

The line that separates the numerator and the denominator is also a symbol for division. The fraction $\frac{3}{4}$, usually read three-fourths, can also be read three divided by four.

A *proper fraction* is one in which the numerator is smaller than the denominator. The value of a proper fraction is less than one.

EXAMPLES

$$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{2}{3}, \frac{3}{8}$$

An *improper fraction* is one in which the numerator is equal to or greater than the denominator. The value of an improper fraction is equal to or greater than one.

EXAMPLES

$$\frac{3}{2}, \frac{4}{3}, \frac{7}{4}, \frac{5}{5}, \frac{9}{6}, \frac{11}{5}, \frac{9}{7}, \frac{13}{8}, \frac{9}{9}$$

A *mixed number* is the sum of a whole number and a fraction.

EXAMPLES

$$1\frac{1}{2}, 5\frac{3}{4}, 8\frac{1}{16}, 10\frac{2}{3}, 15\frac{25}{32}$$

EXERCISES Classify these fractions as proper fractions, improper fractions, or mixed numbers.

- | | | | | | |
|----------------------|-----------------------|-----------------------|-------------------------|-----------------------|-----------------------|
| 1. $\frac{2}{3}$ P | 2. $2\frac{5}{8}$ M | 3. $\frac{2}{1}$ I | 4. $6\frac{2}{3}$ M | 5. $\frac{5}{6}$ P | 6. $\frac{6}{5}$ I |
| 7. $\frac{3}{8}$ P | 8. $\frac{8}{7}$ I | 9. $7\frac{1}{2}$ M | 10. $\frac{5}{3}$ I | 11. $5\frac{1}{8}$ M | 12. $\frac{9}{16}$ P |
| 13. $9\frac{3}{7}$ M | 14. $\frac{10}{11}$ P | 15. $\frac{3}{2}$ P | 16. $\frac{4}{9}$ P | 17. $\frac{9}{7}$ I | 18. $15\frac{5}{8}$ M |
| 19. $\frac{10}{3}$ I | 20. $\frac{14}{17}$ P | 21. $45\frac{1}{2}$ M | 22. $62\frac{11}{45}$ M | 23. $\frac{20}{13}$ I | 24. $\frac{18}{19}$ P |

5b / IMPROPER FRACTIONS, MIXED NUMBERS

Improper fractions can be changed to mixed numbers by dividing.

EXAMPLE

Change $\frac{27}{19}$ to a mixed number.

$$\frac{27}{19} = 27 \div 19$$

$$19 \overline{) 27} \begin{array}{r} 1 \\ 19 \\ \hline 8 \end{array}$$

Remainder

$$\frac{27}{19} = 1\frac{8}{19}$$

Remind students that the purpose of these techniques is to simplify the arithmetic in later problems.

We can also change a mixed number to an improper fraction.

EXAMPLE

Change $8\frac{3}{4}$ to an improper fraction.

Multiply the whole number by the denominator of the fraction.

$$8 \times 4 = 32$$

Add the numerator of the fraction to the product.

$$32 + 3 = 35$$

Place this sum over the original denominator.

$$8\frac{3}{4} = \frac{35}{4}$$

EXAMPLE

Change $9\frac{2}{3}$ to an improper fraction.

$$\begin{aligned} 9\frac{2}{3} &= \frac{(9 \times 3) + 2}{3} \\ &= \frac{27 + 2}{3} \\ &= \frac{29}{3} \end{aligned}$$

EXERCISES Change these improper fractions to mixed numbers.

- | | | | | |
|--|-------------------------------------|---------------------------------------|--|---------------------------------------|
| 1. $\frac{6}{5}$ $1\frac{1}{5}$ | 2. $\frac{8}{7}$ $1\frac{1}{7}$ | 3. $\frac{5}{3}$ $1\frac{2}{3}$ | 4. $\frac{18}{4}$ $4\frac{2}{4}$ or $4\frac{1}{2}$ | 5. $\frac{25}{6}$ $4\frac{1}{6}$ |
| 6. $\frac{33}{9}$ $3\frac{6}{9}$ or $3\frac{2}{3}$ | 7. $\frac{45}{23}$ $1\frac{22}{23}$ | 8. $\frac{50}{13}$ $3\frac{11}{13}$ | 9. $\frac{65}{12}$ $5\frac{5}{12}$ | 10. $\frac{74}{15}$ $4\frac{14}{15}$ |
| 11. $\frac{86}{21}$ $4\frac{2}{21}$ | 12. $\frac{92}{11}$ $8\frac{4}{11}$ | 13. $\frac{115}{21}$ $5\frac{10}{21}$ | 14. $\frac{126}{7}$ 18 | 15. $\frac{139}{12}$ $11\frac{7}{12}$ |

Change these mixed numbers to improper fractions.

- | | | | | |
|------------------------------------|-------------------------------------|-------------------------------------|------------------------------------|---|
| 16. $2\frac{5}{8}$ $\frac{21}{8}$ | 17. $6\frac{2}{3}$ $\frac{20}{3}$ | 18. $7\frac{1}{2}$ $\frac{15}{2}$ | 19. $5\frac{1}{8}$ $\frac{41}{8}$ | 20. $9\frac{3}{7}$ $\frac{66}{7}$ |
| 21. $10\frac{7}{9}$ $\frac{97}{9}$ | 22. $12\frac{1}{2}$ $\frac{25}{2}$ | 23. $14\frac{2}{3}$ $\frac{44}{3}$ | 24. $15\frac{3}{5}$ $\frac{78}{5}$ | 25. $18\frac{1}{4}$ $\frac{73}{4}$ |
| 26. $19\frac{1}{5}$ $\frac{96}{5}$ | 27. $22\frac{1}{6}$ $\frac{133}{6}$ | 28. $15\frac{5}{8}$ $\frac{125}{8}$ | 29. $45\frac{1}{2}$ $\frac{91}{2}$ | 30. $62\frac{11}{45}$ $\frac{2801}{45}$ |

5 C / REDUCING FRACTIONS TO LOWEST TERMS

Fractions are easier to work with if they are reduced to *lowest terms*. A fraction is reduced to lowest terms when the numerator and denominator have no common whole number divisor except 1.

The easiest method of reducing a fraction is to first find the *greatest common divisor*. This is the largest number that divides both the numerator and the denominator.

EXAMPLE

Find the greatest common divisor of the numerator and denominator of $\frac{36}{45}$.

Divisors of 36 are 1, 2, 3, 4, 9, 12, 18, 36

Divisors of 45 are 1, 3, 5, 9, 15, 45

- Therefore, 9 is the greatest common divisor.

To reduce a fraction to lowest terms, divide both the numerator and the denominator by the greatest common divisor.

EXAMPLE

Reduce $\frac{24}{18}$ to lowest terms.

The greatest common divisor is 6.

$$\frac{24}{18} = \frac{24 \div 6}{18 \div 6} = \frac{4}{3}$$

We would get the same result if we used the smaller common divisors, 3 and 2.

$$\frac{24}{18} = \frac{24 \div 3}{18 \div 3} = \frac{8}{6} = \frac{8 \div 2}{6 \div 2} = \frac{4}{3}$$

EXERCISES Reduce these fractions to lowest terms.

- | | | | | |
|---------------------|---------------------|---------------------|---------------------|---------------------|
| 1. $\frac{3}{24}$ | 2. $\frac{6}{12}$ | 3. $\frac{9}{15}$ | 4. $\frac{2}{20}$ | 5. $\frac{4}{32}$ |
| 6. $\frac{5}{25}$ | 7. $\frac{18}{42}$ | 8. $\frac{45}{63}$ | 9. $\frac{21}{35}$ | 10. $\frac{24}{48}$ |
| 11. $\frac{48}{60}$ | 12. $\frac{27}{36}$ | 13. $\frac{28}{42}$ | 14. $\frac{30}{36}$ | 15. $\frac{64}{96}$ |

5d / THE LOWEST COMMON DENOMINATOR

To use fractions in problem solving, we have to be able to find the *lowest common denominator* (LCD) of fractions with unlike denominators. The LCD is the smallest number that all the denominators will evenly divide. Many LCD's can be found by inspection. For the fractions $\frac{1}{3}$ and $\frac{1}{9}$, it is obvious that 9 is the LCD. Also, for $\frac{2}{3}$ and $\frac{3}{4}$, it is obvious that 12 is the LCD. ($3 \times 4 = 12$) When the LCD cannot be found by inspection, we can determine it by computation.

Finding the LCD also simplifies the arithmetic in later problems. It is also essential in adding fractions.

EXAMPLE

Find the LCD for $\frac{5}{12}$ and $\frac{7}{18}$. Then use the LCD to change each to an equivalent fraction.

Find a common divisor for 12 and 18 by inspection or by trial and error. One divisor is 6. Divide 6 into both 12 and 18.

$$\begin{array}{r} 6 \overline{) 12 \quad 18} \\ \underline{2 \quad 3} \end{array}$$

Multiply: $6 \times 2 \times 3 = 36$

- The LCD is 36.
- To change $\frac{5}{12}$ to a fraction with a denominator of 36, divide 36 by 12 and multiply the quotient (3) by the numerator (5). The equivalent fraction is $\frac{15}{36}$. Similarly, the equivalent fraction for $\frac{7}{18}$ is $\frac{14}{36}$.

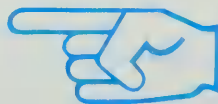
EXAMPLE

Find the LCD for $\frac{1}{3}$, $\frac{5}{6}$, and $\frac{7}{10}$. Then change each to an equivalent fraction using the LCD.

Since there is no common divisor for 3, 6, and 10, find a common divisor for any two of the terms.

$$\begin{array}{r} 3 \overline{) 3 \quad 6 \quad 10} \\ 2 \overline{) 1 \quad 2 \quad 10} \\ \underline{1 \quad 1 \quad 5} \end{array}$$

Since the 10 is not divisible by 3, just bring it down.



- $\text{LCD} = 3 \times 2 \times 1 \times 1 \times 5 = 30$
- $\frac{1}{3} = \frac{10}{30}$; $\frac{5}{6} = \frac{25}{30}$; $\frac{7}{10} = \frac{21}{30}$

If there is no common divisor for the denominators, such as for $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{5}$, the LCD is the product of the denominators.

$$\text{LCD} = 3 \times 4 \times 5 = 60$$

EXERCISES Find the LCD's for these fractions and change each to an equivalent fraction, using the LCD.

1. $\frac{2}{3}, \frac{5}{6}$ **6**; $\frac{4}{6}, \frac{5}{6}$
2. $\frac{1}{3}, \frac{7}{12}$ **12**; $\frac{4}{12}, \frac{7}{12}$
3. $\frac{5}{8}, \frac{1}{6}$ **24**; $\frac{15}{24}, \frac{4}{24}$
4. $\frac{5}{12}, \frac{3}{16}$ **48**; $\frac{20}{48}, \frac{9}{48}$
5. $\frac{5}{7}, \frac{1}{6}$ **42**; $\frac{30}{42}, \frac{7}{42}$
6. $\frac{7}{45}, \frac{3}{20}$ **180**; $\frac{28}{180}, \frac{27}{180}$
7. $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}$ **12**; $\frac{6}{12}, \frac{8}{12}, \frac{9}{12}$
8. $\frac{2}{3}, \frac{1}{6}, \frac{5}{9}$ **18**; $\frac{12}{18}, \frac{3}{18}, \frac{10}{18}$
9. $\frac{5}{12}, \frac{3}{16}, \frac{7}{8}$ **48**; $\frac{20}{48}, \frac{9}{48}, \frac{42}{48}$

5 e / ADDING FRACTIONS

To add fractions with like denominators, add the numerators of the fractions and write the sum over the common denominator.

EXAMPLE

Add: $\frac{3}{25} + \frac{6}{25} + \frac{7}{25} + \frac{14}{25}$

$$\begin{aligned}\frac{3}{25} + \frac{6}{25} + \frac{7}{25} + \frac{14}{25} &= \frac{3 + 6 + 7 + 14}{25} \\ &= \frac{30}{25} \\ &= 1\frac{1}{5}\end{aligned}$$

To add fractions with unlike denominators, first find the LCD. Then use the LCD to write equivalent fractions with the LCD as the denominator. Add the numerators and write the sum over the LCD.

EXAMPLE

Add: $\frac{5}{6} + \frac{7}{12} + \frac{9}{24}$

By inspection, the lowest common denominator is 24.

$$\begin{aligned}\frac{5}{6} &= \frac{20}{24}; \quad \frac{7}{12} = \frac{14}{24}; \quad \frac{9}{24} = \frac{9}{24} \\ \frac{5}{6} + \frac{7}{12} + \frac{9}{24} &= \frac{20}{24} + \frac{14}{24} + \frac{9}{24} \\ &= \frac{20 + 14 + 9}{24} \\ &= \frac{43}{24} \\ &= 1\frac{19}{24}\end{aligned}$$

EXERCISES Add these fractions with like denominators.

- | | | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 1. $\frac{3}{8} + \frac{7}{8}$ | 2. $\frac{4}{7} + \frac{5}{7}$ | 3. $\frac{3}{10} + \frac{9}{10}$ | 4. $\frac{5}{11} + \frac{7}{11}$ |
| 5. $\frac{7}{12} + \frac{11}{12}$ | 6. $\frac{3}{17} + \frac{10}{17}$ | 7. $\frac{3}{20} + \frac{17}{20}$ | 8. $\frac{8}{25} + \frac{17}{25}$ |

Add these fractions with unlike denominators.

- | | | | |
|---|---|---|---|
| 9. $\frac{3}{8} + \frac{5}{12}$ | 10. $\frac{1}{6} + \frac{7}{18}$ | 11. $\frac{2}{7} + \frac{5}{21}$ | 12. $\frac{5}{8} + \frac{3}{24}$ |
| 13. $\frac{1}{2} + \frac{1}{3} + \frac{1}{4}$ | 14. $\frac{1}{4} + \frac{1}{6} + \frac{1}{8}$ | 15. $\frac{5}{64} + \frac{3}{32} + \frac{1}{8}$ | 16. $\frac{1}{7} + \frac{2}{5} + \frac{1}{3}$ |

5 f / SUBTRACTING FRACTIONS

To subtract fractions with like denominators, subtract only the numerators and write the difference over the common denominator.

EXAMPLE

Subtract: $\frac{25}{32} - \frac{17}{32}$

$$\begin{aligned}\frac{25}{32} - \frac{17}{32} &= \frac{25 - 17}{32} \\ &= \frac{8}{32} \\ &= \frac{1}{4}\end{aligned}$$

To subtract fractions with unlike denominators, first find the LCD. Then use the LCD to write equivalent fractions with the LCD as the denominator. Subtract the numerators and write the difference over the LCD.

EXAMPLE

Subtract: $\frac{5}{12} - \frac{1}{3}$

By inspection, the LCD is 12.

$$\begin{aligned}\frac{5}{12} &= \frac{5}{12}, \quad \frac{1}{3} = \frac{4}{12} \\ \frac{5}{12} - \frac{1}{3} &= \frac{5}{12} - \frac{4}{12} \\ &= \frac{5 - 4}{12} \\ &= \frac{1}{12}\end{aligned}$$

EXERCISES Subtract these fractions with like denominators.

- | | | | |
|------------------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 1. $\frac{7}{9} - \frac{5}{9}$ | 2. $\frac{5}{6} - \frac{1}{6}$ | 3. $\frac{8}{13} - \frac{5}{13}$ | 4. $\frac{14}{15} - \frac{8}{15}$ |
| 5. $\frac{17}{18} - \frac{13}{18}$ | 6. $\frac{12}{19} - \frac{7}{19}$ | 7. $\frac{37}{50} - \frac{23}{50}$ | 8. $\frac{51}{100} - \frac{27}{100}$ |

Subtract these fractions with unlike denominators.

- | | | | |
|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|
| 9. $\frac{5}{6} - \frac{17}{24}$ | 10. $\frac{3}{5} - \frac{11}{20}$ | 11. $\frac{1}{5} - \frac{1}{8}$ | 12. $\frac{1}{7} - \frac{1}{12}$ |
| 13. $\frac{3}{8} - \frac{2}{7}$ | 14. $\frac{5}{11} - \frac{1}{12}$ | 15. $\frac{5}{9} - \frac{5}{14}$ | 16. $\frac{9}{16} - \frac{5}{13}$ |

5g / MULTIPLYING FRACTIONS

Since multiplication is commutative, there are short cuts many students will discover for themselves. For example,

$$\begin{aligned}\frac{2}{3} \times \frac{3}{4} \times \frac{1}{2} &= \frac{2 \times 3 \times 1}{3 \times 4 \times 2} = \frac{1 \times 2 \times 3}{4 \times 2 \times 3} \\ &= \frac{1}{4} \times \frac{2}{2} \times \frac{3}{3} = \frac{1}{4} \times 1 \times 1 \\ &= \frac{1}{4}\end{aligned}$$

This allows students to reduce fractions at the same time they are multiplying them.



We multiply fractions by multiplying numerator times numerator and denominator times denominator.

$$\frac{3}{7} \times \frac{2}{3} = \frac{6}{21}$$

This is the product of the numerators.

This is the product of the denominators.

EXAMPLE

Multiply: $\frac{5}{6} \times \frac{2}{3}$

$$\begin{aligned}\frac{5}{6} \times \frac{2}{3} &= \frac{5 \times 2}{6 \times 3} \\ &= \frac{10}{18} \\ &= \frac{5}{9}\end{aligned}$$

It is not necessary to find the LCD when multiplying fractions.

To multiply mixed numbers or mixed numbers and fractions, first change the mixed numbers to improper fractions. Then multiply numerator times numerator and denominator times denominator.

EXAMPLE

Multiply: $1\frac{5}{8} \times 3\frac{1}{2}$

Change mixed numbers to improper fractions.

$$1\frac{5}{8} = 1\frac{3}{8}; 3\frac{1}{2} = \frac{7}{2}$$

Multiply.

$$\begin{aligned}1\frac{5}{8} \times 3\frac{1}{2} &= \frac{13}{8} \times \frac{7}{2} \\ &= \frac{91}{16} \\ &= 5\frac{11}{16}\end{aligned}$$

EXERCISES Find these products.

- $\frac{1}{3} \times \frac{3}{5} \times \frac{1}{5}$
- $\frac{8}{9} \times \frac{7}{8} \times \frac{7}{9}$
- $\frac{4}{7} \times \frac{5}{6} \times \frac{10}{21}$
- $\frac{3}{5} \times \frac{3}{8} \times \frac{9}{40}$
- $\frac{3}{4} \times \frac{2}{9} \times \frac{1}{6}$
- $\frac{1}{3} \times \frac{5}{6} \times \frac{5}{18}$
- $\frac{3}{10} \times \frac{5}{12} \times \frac{1}{8}$
- $\frac{2}{9} \times \frac{3}{11} \times \frac{2}{33}$
- $\frac{7}{12} \times \frac{9}{13} \times \frac{21}{52}$
- $\frac{2}{3} \times \frac{2}{5} \times \frac{2}{7} \times \frac{8}{105}$
- $\frac{5}{8} \times \frac{3}{4} \times \frac{2}{9} \times \frac{5}{48}$
- $\frac{6}{11} \times \frac{1}{5} \times \frac{7}{12} \times \frac{7}{110}$
- $\frac{4}{5} \times \frac{1}{2} \times \frac{13}{15} \times \frac{26}{75}$
- $\frac{3}{14} \times \frac{1}{2} \times \frac{15}{16} \times \frac{45}{448}$
- $\frac{3}{20} \times \frac{7}{15} \times \frac{11}{25} \times \frac{77}{2500}$
- $\frac{12}{17} \times \frac{9}{22} \times \frac{1}{30} \times \frac{9}{935}$
- $\frac{5}{9} \times 1\frac{3}{4} \times \frac{35}{36}$
- $\frac{6}{7} \times 8\frac{2}{3} \times \frac{7}{7}$
- $\frac{7}{2} \times \frac{5}{6} \times 6\frac{1}{4}$
- $\frac{8}{3} \times \frac{4}{9} \times 3\frac{37}{45}$
- $\frac{2}{3} \times 12\frac{5}{7} \times 8\frac{10}{21}$
- $\frac{7}{8} \times 15\frac{1}{2} \times 13\frac{9}{16}$
- $20\frac{3}{4} \times \frac{6}{7} \times 17\frac{1}{14}$
- $10\frac{1}{2} \times 8\frac{1}{3} \times 87\frac{1}{2}$
- $15\frac{2}{11} \times 12\frac{1}{5} \times 185\frac{12}{55}$
- $18\frac{1}{2} \times 19\frac{2}{3} \times 363\frac{5}{6}$
- $24\frac{3}{14} \times 5\frac{4}{5} \times 140\frac{31}{70}$
- $5\frac{1}{2} \times 3\frac{1}{3} \times 7\frac{1}{3}$

5 h / DIVIDING FRACTIONS

To divide fractions, we invert the numerator and denominator of the divisor and multiply.

EXAMPLE

Divide: $\frac{3}{4}$ by $\frac{5}{8}$

$$\begin{aligned}\frac{3}{4} \div \frac{5}{8} &= \frac{3}{4} \times \frac{8}{5} \\ &= \frac{24}{20} \\ &= 1\frac{1}{5}\end{aligned}$$

Remind students that division is the inverse of multiplication. We are actually looking for the fraction that multiplied by $\frac{5}{8}$ will be $\frac{3}{4}$.

Change mixed numbers to improper fractions before dividing.

EXAMPLE

Divide: $3\frac{1}{2}$ by $\frac{3}{7}$

$$\begin{aligned}3\frac{1}{2} \div \frac{3}{7} &= \frac{7}{2} \div \frac{3}{7} \\ &= \frac{7}{2} \times \frac{7}{3} \\ &= \frac{49}{6} \\ &= 8\frac{1}{6}\end{aligned}$$

Sometimes, it is possible to simplify the work in multiplying or dividing fractions by dividing one numerator and one denominator by the same number.

EXAMPLE

Divide: $2\frac{4}{5}$ by $3\frac{1}{2}$

$$\begin{aligned}2\frac{4}{5} \div 3\frac{1}{2} &= \frac{14}{5} \div \frac{7}{2} \\ &= \frac{\cancel{14}^2}{5} \times \frac{2}{\cancel{7}_1} \\ &= \frac{2}{5} \times \frac{2}{1} \\ &= \frac{4}{5}\end{aligned}$$

7 divides evenly into both 14 and 7.

If this is not done, the answer can still be correct. However, you will be using larger numbers.

$$\begin{aligned}2\frac{4}{5} \div 3\frac{1}{2} &= \frac{14}{5} \div \frac{7}{2} \\ &= \frac{14}{5} \times \frac{2}{7} \\ &= \frac{28}{35} \\ &= \frac{4}{5}\end{aligned}$$

EXERCISES Divide these fractions and mixed numbers. Write whole numbers as fractions. (Example: Write 6 as $\frac{6}{1}$.) Reduce answers to lowest terms.

- | | | | |
|---|--|--|--|
| 1. $\frac{3}{4} \div 6$ $\frac{1}{8}$ | 2. $\frac{7}{8} \div 5$ $\frac{7}{40}$ | 3. $4 \div \frac{2}{3}$ 6 | 4. $6 \div \frac{1}{2}$ 12 |
| 5. $\frac{3}{5} \div \frac{4}{7}$ $1\frac{1}{20}$ | 6. $\frac{5}{8} \div \frac{1}{3}$ $1\frac{7}{8}$ | 7. $\frac{7}{9} \div \frac{1}{4}$ $3\frac{1}{9}$ | 8. $\frac{1}{6} \div \frac{4}{5}$ $\frac{5}{24}$ |
| 9. $3\frac{1}{2} \div 2$ $1\frac{3}{4}$ | 10. $4\frac{1}{3} \div 5$ $1\frac{3}{15}$ | 11. $6 \div 2\frac{1}{2}$ $2\frac{2}{5}$ | 12. $8 \div 3\frac{2}{3}$ $2\frac{2}{11}$ |
| 13. $2\frac{1}{2} \div 1\frac{1}{4}$ 2 | 14. $3\frac{3}{8} \div 2\frac{1}{2}$ $1\frac{7}{20}$ | 15. $5\frac{1}{2} \div 6\frac{7}{8}$ $\frac{4}{5}$ | 16. $10\frac{7}{8} \div 12\frac{4}{7}$ $\frac{609}{704}$ |

REVIEW / FRACTIONS

MIXED PROBLEMS

Find the LCD's for these fractions and change each to an equivalent fraction using the LCD.

- $\frac{1}{3}, \frac{1}{4}, \frac{5}{6}$ **12; $\frac{4}{12}, \frac{3}{12}, \frac{10}{12}$**
- $\frac{5}{8}, \frac{7}{12}, \frac{1}{6}$ **24; $\frac{15}{24}, \frac{14}{24}, \frac{4}{24}$**
- $\frac{2}{9}, \frac{1}{4}, \frac{5}{18}$ **36; $\frac{8}{36}, \frac{9}{36}, \frac{10}{36}$**
- $\frac{3}{4}, \frac{7}{8}, \frac{15}{16}$ **16; $\frac{12}{16}, \frac{14}{16}, \frac{15}{16}$**

Change any mixed numbers to improper fractions; then perform the indicated operation. Reduce answers to lowest terms.

- $2\frac{1}{3} \div 15 + \frac{7}{10}$ **$3\frac{17}{30}$**
- $7\frac{1}{2} \div 12\frac{5}{16}$ **$\frac{120}{197}$**
- $\frac{5}{8} \div 3\frac{1}{5}$ **$\frac{25}{128}$**
- $1\frac{13}{24} - \frac{35}{72}$ **$1\frac{1}{18}$**
- $1\frac{2}{3} + \frac{7}{8} - 1\frac{3}{7}$ **$1\frac{19}{168}$**
- $(\frac{5}{8} \times \frac{3}{4}) + \frac{5}{16}$ **$\frac{25}{32}$**
- $(\frac{4}{9} + \frac{1}{3}) \times \frac{7}{8}$ **$\frac{49}{72}$**
- $2\frac{8}{9} \times 2\frac{1}{13}$ **$4\frac{2}{3}$**
- $4\frac{6}{11} - 1\frac{4}{5} + 8\frac{3}{5}$ **$11\frac{19}{55}$**
- $\frac{1}{2} \times 20\frac{1}{4} \times 30\frac{1}{3}$ **$307\frac{1}{8}$**
- $11 - 1\frac{3}{7} - 4\frac{5}{9}$ **$5\frac{1}{63}$**
- $(1\frac{5}{12} \div \frac{34}{6}) - \frac{1}{5}$ **$\frac{1}{20}$**
- $\frac{4}{9} \div \frac{2}{27}$ **$\frac{2}{3}$**
- $(3\frac{5}{8} - \frac{7}{16}) \times 1\frac{3}{7}$ **$4\frac{31}{56}$**
- $1\frac{2}{9} + 4\frac{3}{6} + \frac{5}{3}$ **$7\frac{7}{18}$**
- $\frac{4}{3} \times \frac{9}{16} \times 5\frac{1}{5}$ **$3\frac{9}{10}$**

WORD PROBLEMS

- Arthur and friend plan an Easter holiday driving through Kentucky where the quaint names fascinate them. One day's drive takes them from Coon Valley to High Rabbit Lake and their trip map shows these distances on the route: Coon Valley to Whisky Springs, $17\frac{3}{8}$ kilometres; Whisky Springs to Hound Dog Valley, $19\frac{1}{4}$ kilometres; Hound Dog Valley to Red Feather Mountain, $117\frac{1}{2}$ kilometres; Red Feather Mountain to Muskrat Swamp, $123\frac{5}{8}$ kilometres; Muskrat Swamp to High Rabbit Lake, $115\frac{3}{4}$ kilometres. How many kilometres is it from Coon Valley to High Rabbit Lake? **$393\frac{1}{2}$ kilometres**
 - If Arthur gets 5 kilometres per litre of gas with his car, how many litres of gas will he use between Coon Valley and High Rabbit Lake? **$78\frac{7}{10}$**
 - If Arthur drives non-stop at an average speed of 50 kilometres per hour, how many hours will it take to drive from Coon Valley to High Rabbit Lake? **$7\frac{87}{100}$**
- Helen wants to make new curtains for some windows in her apartment and needs to know how much material to buy. Each curtain will be $169\frac{3}{8}$ centimetres long plus $14\frac{1}{2}$ centimetres at the bottom and $12\frac{3}{8}$ centimetres at the top for

hems. How many centimetres of material will she need for each curtain? **$196\frac{1}{2}$ centimetres**

- Since Helen has three windows, she will need six curtains. How many metres of material will she need for the six curtains? **$11\frac{79}{100}$ metres**
- Helen finds two different fabrics she likes, and isn't sure which one she wants to buy. One is 100 centimetres wide and the other only 50 centimetres wide. If she buys the narrower one, she will need more material than she figured. However, she decides she likes it better and buys two times the amount she originally thought she would need. How many metres of material did she buy? **$23\frac{29}{50}$ metres**
- Tom Jacobs owns a large hardware store and employs seven clerks. Most of the clerks only work part-time, so their hours vary each week. When Tom makes up the payroll, he first has to total everyone's hours from their time cards. He uses the following form.

	Hours Worked May 5 to May 10						Total Hours
	Mon	Tues	Wed	Thurs	Fri	Sat	
Ned	$1\frac{1}{4}$	$4\frac{3}{4}$	$1\frac{1}{2}$	5	$5\frac{1}{6}$	$6\frac{3}{4}$	$24\frac{3}{12}$
Hank	$2\frac{1}{2}$	$5\frac{1}{3}$	0	$4\frac{3}{4}$	0	0	$12\frac{7}{12}$
Stephanie	$5\frac{1}{3}$	$4\frac{2}{3}$	$5\frac{1}{2}$	5	$6\frac{1}{4}$	4	$30\frac{3}{4}$
Eloise	$7\frac{1}{2}$	$8\frac{3}{4}$	8	$7\frac{2}{3}$	$8\frac{3}{4}$	0	$40\frac{2}{3}$
Will	8	$9\frac{1}{2}$	$3\frac{1}{4}$	$7\frac{1}{3}$	$7\frac{3}{4}$	8	$43\frac{7}{6}$
Paul	0	$2\frac{1}{2}$	0	2	$1\frac{3}{4}$	$8\frac{1}{3}$	$14\frac{7}{12}$
Carla	5	$5\frac{1}{2}$	$4\frac{1}{3}$	$5\frac{1}{3}$	$4\frac{3}{4}$	$3\frac{1}{2}$	$28\frac{5}{12}$

Find the number of hours each clerk has worked for the week.

- Tom pays extra for overtime if a clerk works more than 40 hours a week. Did any of the clerks work more than 40 hours the week of May 5? How many hours more? **Eloise: $\frac{2}{3}$ hr more; Will $3\frac{3}{6}$ hr more**
- Claude bought a 10 metre piece of molding to frame two paintings he planned to exhibit. One painting was $\frac{3}{4}$ of a metre long and $\frac{1}{2}$ a metre wide; the other was $1\frac{1}{2}$ metres long and $1\frac{1}{15}$ metres wide. He needs an extra 10 centimetres of molding for each frame since the corners have to be mitred. How

much molding is left after he makes the frame for

CHECK YOUR PROGRESS

$7\frac{1}{2}$ metres the smaller painting? How much is left after both frames are made? (100 centimetres = 1 metre; perimeter = $2 \times (\text{length} + \text{width})$) $2\frac{1}{2} \text{ m}$

5. (a) Ingrid's recipe for Swedish meat balls makes enough for eight people. She is to be responsible for cooking at a skiing weekend party. Before the weekend, she decided to test the recipe and invited three people for dinner and made half the recipe. How much of each of the following ingredients did she need?

250 grams ground beef
130 grams pork sausage
1 large potato
2 slices dry toast
1 medium onion
15 millilitres of salt
5 millilitres of Accent
15 millilitres of sugar
5 millilitres of pepper
 $2\frac{1}{2}$ millilitres of cinnamon
 $2\frac{1}{2}$ millilitres of nutmeg
1 egg
 $\frac{1}{4}$ litre of cream

- (b) On the weekend, she will make three times the recipe. How much will she need of each ingredient?

Answers to Exercise 5.

- (a) 125 grams ground beef

65 grams pork sausage

$\frac{1}{2}$ large potato

1 slice dry toast

$\frac{1}{2}$ medium onion

$7\frac{1}{2}$ millilitres of salt

$2\frac{1}{2}$ millilitres of Accent

- (b) 750 grams ground beef

390 grams pork sausage

3 large potatoes

3 slices dry toast

3 medium onions

45 millilitres of salt

15 millilitres of Accent

$7\frac{1}{2}$ millilitres of sugar

$2\frac{1}{2}$ millilitres of pepper

$1\frac{1}{4}$ millilitres of cinnamon

$1\frac{1}{4}$ millilitres of nutmeg

$\frac{1}{2}$ egg

$\frac{1}{8}$ litres of cream

45 millilitres of sugar

15 millilitres of pepper

$7\frac{1}{2}$ millilitres of cinnamon

$7\frac{1}{2}$ millilitres of nutmeg

3 eggs

$\frac{3}{4}$ litre of cream

Classify these fractions as proper fractions, improper fractions, or mixed numbers.

1. $1\frac{3}{5}$ 2. $1\frac{10}{9}$ 3. $4\frac{3}{12}$ 4. $\frac{6}{13}$

Change the improper fractions to mixed numbers.

Change the mixed numbers to improper fractions.

5. $\frac{68}{11}$ $6\frac{2}{11}$ 6. $3\frac{5}{6}$ $\frac{23}{6}$
7. $9\frac{2}{3}$ $\frac{29}{3}$ 8. $\frac{35}{8}$ $4\frac{3}{8}$
9. $2\frac{5}{7}$ $\frac{19}{7}$

Find the LCD's for these fractions and change each to an equivalent fraction using the LCD.

10. $\frac{11}{12}, \frac{8}{15}, \frac{3}{20}$ $\frac{55}{60}, \frac{32}{60}, \frac{9}{60}$
11. $\frac{3}{4}, \frac{5}{16}, \frac{7}{8}$ $\frac{12}{16}, \frac{5}{16}, \frac{14}{16}$
12. $\frac{7}{9}, \frac{1}{4}, \frac{11}{12}$ $\frac{28}{36}, \frac{9}{36}, \frac{33}{36}$

Add or subtract. Reduce your answers to lowest terms.

13. $\frac{13}{16} + \frac{5}{12}$ $1\frac{11}{48}$ 14. $5\frac{3}{11} - 4\frac{7}{8}$ $\frac{35}{88}$
15. $4\frac{2}{5} - \frac{7}{10}$ $3\frac{7}{10}$ 16. $3\frac{4}{7} + \frac{5}{6}$ $4\frac{17}{42}$

Multiply or divide. Reduce your answers to lowest terms.

17. $\frac{4}{9} \div \frac{2}{3}$ $\frac{2}{3}$ 18. $13\frac{3}{8} \times 5\frac{1}{12}$ $67\frac{5}{96}$
19. $3\frac{6}{13} \div 15\frac{5}{26}$ 20. $\frac{7}{12} \times 5$ $2\frac{1}{12}$

85

DECIMAL NUMBERS

CHAPTER 6

WEEKLY EXPENSE REPORT

NAME CARL WATKINS DIVISION SALES DEPARTMENT OUTSIDE APPROVAL RGA

WEEK ENDING AUGUST 23, 1975

DAY AND DATE	ITINERARY SCHOOL OR COMPANY & CITY VISITED	TRAVEL			LIVING		MEALS		MISC		ENTERTAINMENT	EXPLAIN MISCELLANEOUS AND ENTERTAINMENT EXPENSES (Must include names of individuals and affiliation)
		Daily Bus Miles	G Total, Oil # M Maintenance # P Parking # T Tolls	Total or Time	Room Cost and Tax Only #	Meals Costs to Include Tips	P POSTAGE \$	T TEL \$	S SUPP			
SAT 18	FREMONT CO.						B					L.W. FREMONT PRES. FREMONT CO.
8	DAYVILLE						D 17 80					
SUN							B					
MON							L					
TUE							D					
WED 22	TRANSWORLD DIAL CORP CENTER CITY	240	6 8 00 P 2 50		14 52		L 3 50 D 28 80					JOHN BAXTER PROD. MGR. TRANSWORLD DIAL
8	TRANSWORLD DIAL CORP CENTER CITY	12	P 2 50		14 52		B 2 80 D 24 30 D 7 00					
THU 23	INDEPENDENT FIXTURES CO. CENTER CITY	31			14 52		B 1 60 D 5 30 D 20 45					HENRY JACOBS PROD. MGR. INDEPENDENT FIXTURES
8												
Totals	Total Kilometers Travelled →	300	1 17 00 S		5 43 56 S		111 65 S					* ATTACH RECEIPTS TO THIS REPORT

Decimals appear most frequently in computations involving money. In this expense summary, Carl Watkins lists his expenses for entertaining customers or prospec-

tive customers. He also lists all his living expenses when he is travelling. His company reimburses him for these expenses at the end of the week.

PRE-TESTS

Read these decimal numbers.

1. 0.9 2. 0.08 3. 0.011 4. 4.018 5. 361.902

Write these as decimal numbers.

6. 3 and 19 thousandths 7. 26 8. $471\frac{9}{10}$ 9. $45\frac{1}{100}$

a

Align and add these numbers.

1. 0.363, 3.707, 0.83, 0.064, 9.87 2. 2.539, 0.503, 183, 1.19, 74.7
3. 0.252, 2.696, 0.72, 0.731, 8.76 4. 3.628, 0.412, 345, 2.28, 63.6

Align these numbers and subtract.

5. $0.58 - 0.43$ 6. $0.85 - 0.67$ 7. $7.42 - 0.96$ 8. $29.056 - 17.6009$

b

Multiply these numbers and place the decimal points in the products.

1. 0.7×0.2 2. 0.45×0.76 3. 0.036×0.33 4. 0.357×23.06

c

Divide these numbers and check your answers by multiplying.

1. $7.98 \div 3.8$ 2. $41.86 \div 32.2$ 3. $110.4 \div 32$ 4. $1572.48 \div 50.4$

d

Change these decimal fractions to common fractions and reduce to lowest terms.

1. 0.4 2. 0.26 3. 0.006 4. 0.036 5. 0.250

Change these common fractions to decimal fractions.

6. $\frac{1}{20}$ 7. $\frac{1}{25}$ 8. $\frac{7}{8}$ 9. $\frac{3}{4}$ 10. $\frac{5}{32}$

e

Round these numbers to the decimal places indicated.

1. 0.82 (1 place) 2. 0.884 (2 places) 3. 0.404 (2 places)
4. 0.5025 (3 places) 5. 0.0273761 (4 places) 6. 0.71635071 (5 places)

f

ANSWERS
(a) 1. nine tenths 2. eight hundredths 3. eleven thousandths 4. four and eighteen thousandths
(b) 1. 14.834 2. 261.932 3. 13.159 4. 414.920 5. 0.15 6. 0.18 7. 6.46 8. 11.4561 (c) 1. 0.14
2. 0.3420 3. 0.01188 4. 8.28242 (d) 1. 2.1 2. 1.3 3. 3.45 4. 31.2 (e) 1. $\frac{2}{5}$ 2. $\frac{13}{50}$ 3. $\frac{3}{500}$ 4. $\frac{9}{250}$
5. $\frac{1}{4}$ 6. 0.05 7. 0.04 8. 0.875 9. 0.75 10. 0.15625 (f) 1. 0.8 2. 0.88 3. 0.40 4. 0.503 5. 0.0274 6. 0.71635

6 a / FUNDAMENTAL CONCEPTS

Emphasize the importance of place value in decimal numbers.

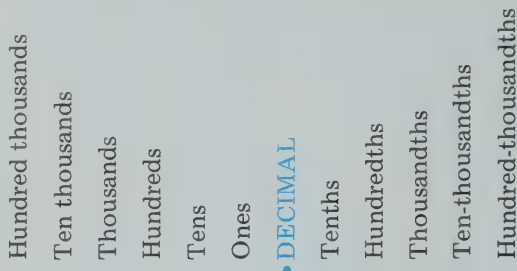
A decimal fraction (or decimal number) is another way of writing a common fraction or mixed number. Just as we use place value to read whole numbers, we use place value to read decimal numbers.

The positions showing place value for whole numbers and decimal fractions are shown below.

Answers to Exercises

1. six tenths
2. four tenths
3. four hundredths
4. six and three hundredths
5. one and three tenths
6. twenty-nine and seventy-two hundredths
7. two thousandths
8. eleven and two hundred nine thousandths
9. twenty-nine and twenty-five ten-thousandths
10. two hundred forty-two and nine thousand eight hundred seventy-six ten-thousandths

Point out how zero is used to hold the place value.



Now we can read decimal numbers using the place value positions above.

EXAMPLES

0.8 is read eight *tenths* ($\frac{8}{10}$)

0.08 is read eight *hundredths* ($\frac{8}{100}$)

3.8 is read three *and* eight tenths ($3\frac{8}{10}$)

42.057 is read forty-two *and* fifty-seven thousandths ($42\frac{57}{1000}$)



Any whole number, fraction, or mixed number can be written as a decimal number.

EXAMPLES

5 tenths ($\frac{5}{10}$) is written 0.5

52 hundredths ($\frac{52}{100}$) is written 0.52

52 thousandths ($\frac{52}{1000}$) is written 0.052

14 *and* 23 ten-thousandths ($14\frac{23}{10000}$) is written 14.0023

562 is written 562.

EXERCISES Read these decimal numbers.

- | | | | | |
|----------|----------|-----------|------------|--------------|
| 1. 0.6 | 2. 0.4 | 3. 0.04 | 4. 6.03 | 5. 1.3 |
| 6. 29.72 | 7. 0.002 | 8. 11.209 | 9. 29.0025 | 10. 242.9876 |

Write these as decimal numbers.

- | | | |
|--------------------------------|-----------------------------|------------------------------|
| 11. 5 tenths 0.5 | 12. 3 and 9 hundredths 3.09 | 13. 9 thousandths 0.009 |
| 14. 2 and 15 thousandths 2.015 | 15. 98 ten-thousandths | |
| 16. 867 867. | 17. $\frac{3}{100}$ 0.03 | 18. $16\frac{39}{100}$ 16.38 |
| | 19. $\frac{8}{1000}$ 0.008 | 20. $\frac{456}{1000}$ 0.456 |

6 b / ADDING, SUBTRACTING DECIMAL NUMBERS

Before adding or subtracting whole numbers, we arranged the ones, tens, hundreds, and so on in vertical columns. Similarly, before adding or subtracting decimal numbers, we must arrange the digits in vertical columns. This time we arrange the tenths, hundredths, thousandths, and so on.

- Align all the decimal points.
- Be sure that each digit is in its proper place value position.



After the numbers are properly aligned, add or subtract as if the numbers were whole numbers, ignoring the decimal point. The decimal point is placed in the sum or difference directly under the decimal points in the problem. It divides the answer into a whole number and a decimal fraction.

This concept is relatively simple and is related to addition and subtraction of whole numbers. In those problems, the corresponding digits of the same place value are combined. In decimal problems, the same is true.

EXAMPLE

Align and add these decimal numbers: 3.2, 18.061, 0.28, 15.46, 7.008

$$\begin{array}{r}
 3 2 \\
 18 061 \\
 0 28 \\
 15 46 \\
 7 008 \\
 \hline
 44 009
 \end{array}$$

EXAMPLE

Align and subtract: $336.78 - 54.146$

$$\begin{array}{r}
 336 78 \\
 - 54 146 \\
 \hline
 282 634
 \end{array}$$

EXERCISES Align and add these numbers.

- | | |
|---|---|
| 1. 0.03, 5, 7.2, 3.8, 12.27 28.30 | 2. 0.05, 8.3, 6, 13.7, 8.8 36.85 |
| 3. 2.27, 13.05, 12, 9.7, 5.26 42.28 | 4. 8.13, 11.29, 6.7, 4, 23.3 53.42 |
| 5. 3.45, 8, 30.32, 3.978, 6.12 51.868 | 6. 9.82, 27, 63.53, 3.624, 4.05 108.024 |
| 7. 0.141, 1.587, 0.61, 0.842, 7.65 10.830 | 8. 3.307, 0.615, 200, 1.23, 47.5 252.652 |
| 9. 876.3, 45.96, 102.1, 0.24686 1024.60686 | 10. 329.5, 71.08, 316.4, 0.56779 717.54779 |

Align these numbers and subtract.

- | | | | |
|-------------------------------|-------------------------------|----------------------------------|-----------------------------------|
| 11. $0.9 - 0.6$ 0.3 | 12. $0.8 - 0.4$ 0.4 | 13. $0.38 - 0.3$ 0.08 | 14. $2.42 - 0.7$ 1.72 |
| 15. $1.09 - 0.82$ 0.27 | 16. $3.13 - 0.35$ 2.78 | 17. $21.003 - 15.2$ 5.803 | 18. $25.31 - 18.008$ 7.302 |

6 C / MULTIPLYING DECIMAL NUMBERS

We multiply decimal numbers as if they were whole numbers, ignoring the decimal points until we have the digits in the product. The number of decimal places in the product is the sum of the number of decimal places in the two factors.

EXAMPLE

Multiply: 0.05×32.365

$$\begin{array}{r} 32.365 \\ \times 0.05 \\ \hline 1.61825 \end{array}$$

3 decimal places
+ 2 decimal places
5 decimal places in the product

EXAMPLE

Multiply: 1.32×15.24

$$\begin{array}{r} 15.24 \\ \times 1.32 \\ \hline 3048 \\ 4572 \\ 1524 \\ \hline 20.1168 \end{array}$$

2 decimal places
+ 2 decimal places
4 decimal places in the product

By rounding the factors to the nearest whole number, we can check to see if the answer is reasonable. For the example above,

15.24 rounded to the nearest whole number is 15

1.32 rounded to the nearest whole number is 1

Since $15 \times 1 = 15$, we know the answer must have two whole number digits. Therefore, the answer will *not* be 2.01168 or 201.168.

EXERCISES Multiply these numbers and place the decimal points in the products.

- | | | |
|--|---|---|
| 1. 0.8×0.3 0.24 | 2. 0.9×0.4 0.36 | 3. 0.89×0.35 0.3115 |
| 4. 0.77×0.24 0.1848 | 5. 0.04×0.06 0.0024 | 6. 0.03×0.09 0.0027 |
| 7. 0.51×0.06 0.0306 | 8. 0.08×0.43 0.0344 | 9. 0.369×0.21 0.07749 |
| 10. 0.46×0.258 0.11868 | 11. 0.007×0.56 0.00392 | 12. 0.72×0.045 0.03240 |
| 13. 1.4×3.06 4.284 | 14. 7.22×3.8 27.436 | 15. 15.2×18.5 281.20 |
| 16. 26.4×12.6 332.64 | 17. 1.69×5.032 8.50408 | 18. 10.42×15.33 159.7386 |
| 19. 27.35×31.23 854.1405 | 20. 50.05×31.44 1573.5720 | 21. 6.246×5.34 33.35364 |
| 22. 7.28×9.456 68.83968 | 23. 38.22×8.246 315.16212 | 24. 46.13×27.357 1261.97841 |

6 d / DIVIDING DECIMAL NUMBERS

In multiplying decimal numbers, the *last* operation is to place the decimal point in the product. Placing the decimal point in the quotient is the *first* operation in dividing decimal numbers.

- Count the number of places to the right of the decimal point in the divisor.
- Count the same number of places to the right of the decimal point in the dividend.
- Place the decimal point in the quotient directly above.



EXAMPLE

Divide: 0.1104 by 0.48

$$\begin{array}{r} 0.23 \\ 0.48 \overline{) 0.1104} \\ \underline{96} \\ 144 \\ \underline{144} \\ 0 \end{array}$$

There are 2 places to the right of the decimal point in the divisor. Count 2 places to right of the decimal point in the dividend and place the decimal point directly above.

EXAMPLE

Divide: 234.85 by 385

$$\begin{array}{r} 0.61 \\ 385 \overline{) 234.85} \\ \underline{231} \\ 385 \\ \underline{385} \\ 0 \end{array}$$

There are no places to the right of the decimal point in the divisor. So, place the decimal point directly above the decimal point in the dividend.

EXAMPLE

Divide: 48.3 by 3.22

$$\begin{array}{r} 15.0 \\ 3.22 \overline{) 48.30} \\ \underline{32} \\ 1610 \\ \underline{1610} \\ 0 \end{array}$$

There are 2 places to the right of the decimal point in the divisor. Since there is only 1 place to the right of the decimal point in the dividend, add a zero and count 2 places. Place the decimal point directly above.

EXERCISES Divide these numbers and check your answers by multiplying the quotient by the divisor.

1. $229.6 \div 28$ **8.2**

4. $500.5 \div 55$ **9.1**

7. $229.488 \div 8.4$ **27.32**

10. $57.5276 \div 9.62$ **5.98**

2. $2606.4 \div 36.2$ **72**

5. $763.56 \div 63$ **12.12**

8. $456.5 \div 18.26$ **25**

11. $197.4764 \div 12.13$ **16.28**

3. $155.4 \div 3.7$ **42**

6. $1098.24 \div 15.6$ **70.4**

9. $976.872 \div 40.3$ **24.24**

12. $300.502848 \div 14.132$ **21.264**

6 e / DECIMAL AND COMMON FRACTIONS

We can change a decimal fraction to a common fraction using place value.

EXAMPLES

Change 0.4, 0.45, and 0.455 to common fractions and reduce them to lowest terms.

0.4 is read four tenths or $\frac{4}{10}$

$$\frac{4}{10} = \frac{2}{5}, \text{ so } 0.4 = \frac{2}{5}$$

0.45 is read forty-five hundredths or $\frac{45}{100}$

$$\frac{45}{100} = \frac{9}{20}, \text{ so } 0.45 = \frac{9}{20}$$

0.455 is read four hundred fifty-five thousandths or $\frac{455}{1000}$

$$\frac{455}{1000} = \frac{91}{200}, \text{ so } 0.455 = \frac{91}{200}$$

We can change a common fraction to a decimal fraction by dividing the denominator of the fraction into the numerator.

EXAMPLE

Change $\frac{1}{2}$ to a decimal fraction.

$$\frac{1}{2} = 1 \div 2$$

$$\frac{1}{2} = 0.5$$

$$\begin{array}{r} 0.5 \\ 2 \overline{) 1.0} \\ \underline{10} \\ 0 \end{array}$$

$$\text{Check: } 0.5 = \frac{5}{10} = \frac{1}{2}$$

EXAMPLE

Change $\frac{5}{8}$ to a decimal fraction.

$$\frac{5}{8} = 5 \div 8$$

$$\frac{5}{8} = 0.625$$

$$\begin{array}{r} 0.625 \\ 8 \overline{) 5.000} \\ \underline{48} \\ 20 \\ \underline{16} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

$$\text{Check: } 0.625 = \frac{625}{1000} = \frac{5}{8}$$

EXERCISES Change these decimal fractions to common fractions and reduce them to lowest terms.

1. 0.6 $\frac{3}{5}$

2. 0.04 $\frac{1}{25}$

3. 0.72 $\frac{18}{25}$

4. 0.48 $\frac{12}{25}$

5. 0.004 $\frac{1}{250}$

6. 0.008 $\frac{1}{125}$

7. 0.025 $\frac{1}{40}$

8. 0.125 $\frac{1}{8}$

9. 0.875 $\frac{7}{8}$

10. 0.538 $\frac{269}{500}$

Change these common fractions to decimal fractions.

11. $\frac{1}{4}$ 0.25

12. $\frac{1}{5}$ 0.2

13. $\frac{1}{8}$ 0.125

14. $\frac{1}{10}$ 0.1

15. $\frac{1}{40}$ 0.025

16. $\frac{1}{50}$ 0.02

17. $\frac{3}{8}$ 0.375

18. $\frac{3}{5}$ 0.6

19. $\frac{7}{10}$ 0.7

20. $\frac{8}{25}$ 0.32

6 f / ROUNDING DECIMAL NUMBERS

If you divide 10 by 0.03, the quotient will never be exact. How do you know when to stop dividing? That is, how *precise* does your answer need to be? A scientist may want a precise measurement involving many decimal places. In working with dollars and cents, we only need accuracy to two places or to the nearest penny. An auto mechanic in checking the spark plug gap needs accuracy within a thousandth of an inch. However, this is a crude measurement when compared to the photoelectric measurement of the diameter of a human hair.

So, the number of decimal places you use depends on how precise you want your measurement. Suppose you decide you need an answer only to one decimal place. You would round your answer to the nearest tenth.

$$\begin{array}{r} 333.33 \\ 0.03 \overline{)10.0000} \\ \underline{9} \\ 10 \\ \underline{9} \\ 10 \\ \underline{9} \\ 10 \\ \underline{9} \\ 1 \end{array}$$

If rounding to tenths, look at hundredths:
less than 5—drop
5 or more—add one to tenths



This table shows 0.36271845 rounded to hundredths, thousandths, and so on.

Hundredths	2 places	0.36
Thousandths	3 places	0.363
Ten-thousandths	4 places	0.3627
Hundred-thousandths	5 places	0.36272
Millionths	6 places	0.362718
Ten-millionths	7 places	0.3627185

EXAMPLE

Round 0.849625 to the nearest thousandth (three places).

0.849625 rounded to three places is 0.850

Statisticians frequently prefer another method for rounding decimal numbers.

If rounding to tenths, look at hundredths:
even number—drop
odd number—add one to tenths



Have students practice rounding numbers both ways. Tell them that it doesn't matter which method they use, as long as they are consistent.

EXERCISES Round these numbers to the decimal places indicated using the first method above.

- 0.67 (1 place) **0.7**
- 0.825 (2 places) **0.83**
- 0.305 (2 places) **0.31**
- 0.4783 (3 places) **0.478**
- 0.390614 (4 places) **0.3906**
- 0.1529036 (5 places) **0.15290**

Round these numbers to three decimal places using the statisticians method. Add them before and after rounding to compare the sums.

- | | | | |
|----------------------------|----------------------------|----------------------------|----------------------------|
| 7. 0.2273 0.228 | 8. 0.5301 0.531 | 9. 0.2732 0.273 | 10. 0.0353 0.036 |
| 0.1294 0.129 | 0.9788 0.978 | 0.2199 0.220 | 0.2872 0.287 |
| 0.5995 0.600 | 0.3063 0.307 | 0.9544 0.954 | 0.6032 0.603 |
| 0.0768 0.076 | 0.8155 0.816 | 0.6076 0.607 | 0.1853 0.186 |
| 0.2177 0.218 | 0.3452 0.345 | 0.7125 0.713 | 0.5439 0.544 |
| 0.1436 0.143 | 0.4546 0.454 | 0.4131 0.414 | 0.4558 0.455 |
| <u>1.3943</u> 1.394 | <u>3.4305</u> 3.431 | <u>3.1807</u> 3.181 | <u>2.1107</u> 2.111 |

REVIEW / DECIMAL NUMBERS

MIXED PROBLEMS

Add these decimal numbers.

- Four hundredths plus nine plus six and one tenth plus five and nine tenths plus eighteen plus ten and thirty-five hundredths **49.39**
- Four hundred thirty-eight thousandths plus four and twenty-eight hundredths plus fifteen plus thirty and forty-one hundredths plus four and two hundred forty-six thousandths plus three and three hundredths **57.404**
- Four and four hundred eighteen thousandths plus seven hundred twenty-five thousandths plus one hundred plus two and thirty-four hundredths plus fifty-eight and six tenths **166.083**
- Eight hundredths plus twenty-five plus sixteen and three tenths plus seven hundred sixty-four and four tenths plus thirty-four and eighty-five hundredths plus eighty-two and nine thousandths **922.639**

Change these common fractions to decimal fractions and then subtract.

- | | |
|---|---|
| 5. $\frac{3}{4} - \frac{3}{8}$ 0.375 | 6. $\frac{7}{8} - \frac{5}{16}$ 0.5625 |
| 7. $\frac{9}{10} - \frac{4}{5}$ 0.1 | 8. $\frac{5}{8} - \frac{3}{20}$ 0.475 |

Multiply or divide.

- | | |
|--------------------------------------|--|
| 9. 0.77×35 26.95 | 10. $1152.5 \div 25$ 46.1 |
| 11. $1023.06 \div 28.9$ 35.4 | 12. 0.009×0.56 0.00504 |
| 13. 0.32×0.28 0.0896 | 14. $23.76 \div 29.7$ 0.8 |
| 15. $1165.96 \div 28.3$ 41.2 | 16. 4.01×0.444 1.78044 |

Round these numbers to three decimal places. Add them before and after rounding to compare the sums.

- | | |
|-----------------------------|------------------------------|
| 17. 0.2158 0.216 | 18. 0.8652 0.865 |
| 0.5150 0.515 | 0.7969 0.797 |
| 0.9383 0.938 | 0.4545 0.455 |
| 0.2295 0.230 | 0.4317 0.432 |
| 0.2974 0.297 | 0.3074 0.307 |
| 0.7017 0.702 | 0.8030 0.803 |
| <u>2.8977</u> 2.898 | <u>3.6587</u> 3.659 |
| 19. 0.58388 0.584 | 20. 0.36982 0.370 |
| 0.72165 0.722 | 0.479512 0.480 |
| 0.51009 0.510 | 0.40162 0.402 |
| 0.84361 0.844 | 0.529082 0.529 |
| 0.21194 0.212 | 0.94733 0.947 |
| 0.60739 0.607 | 0.16358 0.164 |
| <u>3.47856</u> 3.479 | <u>2.890944</u> 2.892 |

WORD PROBLEMS

- (a) The accounting department of the Ray Vaughn & Joe King Company prepared a list of the company's assets as of December 31.
Cash on hand and in the banks: \$27 395.42
Accounts receivable: \$21 776.61
Merchandise inventory: \$35 343.50
Building at net cost after depreciation: \$95 378.00
Furniture and fixtures at net cost after depreciation: \$18 746.50
Other assets: \$20 369.33
What is the total amount of assets owned by the company as of December 31? **\$219 009.36**
- (b) The accounting department also prepared a list of the company's liabilities as of December 31.
Accounts payable to creditors: \$8148.26
Taxes payable: \$2193.48
Notes payable to the bank: \$10 350.00
Mortgage on the building: \$47 468.30
Other liabilities: \$6235.40
What is the total amount of liabilities of the company as of December 31? **\$74 395.44**
- (c) How much more does the company have in assets than in liabilities? **\$144 613.92**
- (a) Cecile has a chequing account with the Toronto-Dominion Bank. Her balance at the beginning of November was \$720.68. She made four deposits during the month; each deposit was \$93.72. How much did she deposit during the month? **\$374.88**
- (b) Cecile wrote cheques for these amounts during November: \$140, \$32.71, \$6.43, \$23.90, \$8.08, \$16.41, \$10.95, and \$63.22. What was the total amount of the cheques she wrote? **\$301.70**
- (c) By adding the deposits to the beginning balance and subtracting the cheques from this sum, Cecile could find out what her balance was at the end of November. What was this balance? **\$793.86**
3. Edna's Fabric Store buys bolts of material from several suppliers. Whenever possible, Edna buys parts of bolts because they are less expensive. Also, different fabrics have a different number of metres per bolt. Edna was planning to have a sale and made the following purchases.

Number of Bolts	Number of metres per Bolt	Total Cost	
6	35.4	\$392.94	\$1.85
14	18.6	\$190.09	\$0.73
22	40.0	\$1936.00	\$2.20
11	15.0	\$161.70	\$0.98
19	20.0	\$292.60	\$0.77
4	13.5	\$496.80	\$9.20

What was the cost per metre for each purchase?

4. Colleen, an employee in the office of R. A. Charles Hardware Supplies, prepared an invoice to be sent to Taravel Hardware.

Quantity	Description	Unit Price	Amount
15	Hammer	\$ 7.77	\$116.55
23	Cross-cut saw	10.73	\$246.79
28	Left-handed wrench	6.59	\$184.52
33	Ratchet screw driver	11.70	\$386.10
5	Skyhook	29.94	\$149.70
40	Metric rule	2.85	\$114.00

What is the total amount for each item? What is the total amount of the invoice? **\$1197.66**

CHECK YOUR PROGRESS

Align and add these numbers.

- 52.61, 0.093, 10.064, 0.18, 0.325, 7.6481 **70.9201**
- 11.052, 0.0095, 6.11, 0.8, 142.6, 98 **258.5715**

Align these numbers and subtract.

- 0.784 - 0.0265 **0.7575**
- 6.7 - 0.78 **5.92**
- 31.005 - 19.4065 **11.5985**

Multiply or divide.

- 0.837 ÷ 2.7 **0.31**
- 0.48 × 3.2 **1.536**
- 5.626 ÷ 58 **0.097**
- 5.08 648 ÷ 24.8 **0.2051**
- 9.06 × 1.8 **16.308**
- 0.981 × 50.63 **49.66803**

Change the decimal fractions to common fractions.

Change the common fractions to decimal fractions.

- $\frac{4}{5}$ **0.8**
- 0.64 $\frac{16}{25}$
- $\frac{7}{15}$ **0.467**
- 0.824 $\frac{103}{125}$
- 0.625 $\frac{5}{8}$

Round these numbers to the decimal places indicated.

- 0.465 (1 place) **0.5**
- 0.08236 (3 places) **0.082**
- 0.6085 (2 places) **0.61**
- 0.3056982 (4 places) **0.3057**

CHAPTER 7

PERCENT, RATIO, AND PROPORTION

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INVOICE

An invoice is sometimes considered the official record of an order and the cost of that order. Then, a bill for payment is presented at a later date. However, more frequently, the invoice requests payment. Notice that

Adanac Publications, Ltd. is giving the New College Bookstore a discount of 40%. This is often done when items are bought for resale by a retail outlet.

PRE-TESTS

Change these percents to fractions and reduce to lowest terms.

1. 2% 2. 12% 3. 98% 4. 0.25% 5. 0.75%

a

Change these percents to decimal numbers.

6. 5% 7. 10% 8. 0.05% 9. 0.9% 10. 23.7%

Change these fractions to percents.

1. $\frac{5}{8}$ 2. $\frac{6}{10}$ 3. $\frac{3}{25}$ 4. $\frac{1}{100}$ 5. $\frac{129}{1000}$

b

Change these decimals to percents.

6. 0.5 7. 0.8 8. 0.83 9. 0.125 10. 0.3691

Find the missing values in these proportions.

1. $\frac{?}{5} = \frac{7}{35}$ 2. $\frac{3}{5} = \frac{?}{45}$ 3. $\frac{?}{11} = \frac{24}{88}$ 4. $\frac{7}{15} = \frac{?}{75}$ 5. $\frac{1}{125} = \frac{8}{?}$

c

Find these percents.

1. What percent of 138 is 76? 2. What percent of 391 is 50?
3. What percent of 9869 is 86? 4. What percent of 477 is 360?

d

Find these percentages.

1. 1% of 3289 2. 45% of 74 3. 82% of 548 4. 0.4% of 425

e

Find these total amounts.

1. 15% of what is 55.2? 2. 13% of what is 66.82?
3. 3.9% of what is 17.082? 4. 0.8% of what is 10.896?

f

ANSWERS
(a) 1. $\frac{1}{50}$ 2. $\frac{3}{25}$ 3. $\frac{49}{50}$ 4. $\frac{1}{400}$ 5. $\frac{7}{400}$ 6. 0.05 7. 0.10 8. 0.0005 9. 0.009 10. 0.237 (b) 1. 625% 2. 60% 3. 12% 4. 1% 5. 12.9% 6. 50% 7. 80% 8. 83% 9. 12.5% 10. 36.91% (c) 1. 1 2. 27 3. 3 4. 35 5. 1000 (d) 1. 55% 2. 12.8% 3. 0.87% 4. 75.5% (e) 1. 32.89 2. 33.3 3. 449.36 4. 1.7 (f) 1. 368 2. 514 3. 438 4. 1362

7 a / FUNDAMENTAL CONCEPTS—PERCENT

You have received a marked test which you wrote a few days before. The result reads seventy percent. What does percent mean?

Percent means “by the hundred.” The symbol used to denote percent is %.

Since percent is a ratio, let's begin by discussing ratio. The *ratio* of two numbers is the quotient of the numbers. A ratio is usually written as a fraction.

EXAMPLES

The ratio of 1 to 2 is $\frac{1}{2}$. The rate of 56 to 100 is $\frac{56}{100}$.



Every fraction is a ratio.

Any fraction with a denominator of 100 can be expressed as a percent. If anything is divided into 100 equal parts, each part is $\frac{1}{100}$ or 1% of the total. 100 parts represent $\frac{100}{100}$ or 100%.



Since there are 100 parts, $\frac{100}{100}$ or 100% is the whole. That is, $100\% = 1$.

Percents may be changed to fractions and to decimals. We use the fact that a percent is a fraction with a denominator of 100.

EXAMPLES

Change 25% to a fraction. $25\% = \frac{25}{100} = \frac{1}{4}$

Change 37.5% to a fraction. $37.5\% = \frac{37.5}{100} = \frac{375}{1000} = \frac{3}{8}$

To change a percent to a decimal, write the percent as a fraction. Then write the fraction as a decimal.

EXAMPLES

Change 75% to a decimal. $75\% = \frac{75}{100} = 0.75$

Change 43.5% to a decimal. $43.5\% = \frac{43.5}{100} = \frac{435}{1000} = 0.435$

EXERCISES

Change these percents to fractions and reduce to lowest terms.

- | | | | | |
|-----------------------------|--------------------------|-----------------------------|----------------------------|-----------------------------|
| 1. 10% $\frac{1}{10}$ | 2. 35% $\frac{7}{20}$ | 3. 68% $\frac{17}{25}$ | 4. 3% $\frac{3}{100}$ | 5. 3.2% $\frac{4}{125}$ |
| 6. 0.25% $\frac{1}{400}$ | 7. 0.75% $\frac{3}{400}$ | 8. 5.15% $\frac{103}{2000}$ | 9. 14.6% $\frac{73}{500}$ | 10. 39.4% $\frac{197}{500}$ |
| 11. 90.5% $\frac{181}{200}$ | 12. 0.6% $\frac{3}{500}$ | 13. 0.03% $\frac{3}{10000}$ | 14. 0.02% $\frac{1}{5000}$ | 15. 0.375% $\frac{3}{800}$ |

Change these percents to decimal numbers.

- | | | | | |
|-----------------|-----------------|-------------------|-------------------|-------------------|
| 16. 15% 0.15 | 17. 32% 0.32 | 18. 7% 0.07 | 19. 9% 0.09 | 20. 28% 0.28 |
| 21. 57% 0.57 | 22. 82% 0.82 | 23. 95% 0.95 | 24. 34.4% 0.344 | 25. 29.6% 0.296 |
| 26. 52.3% 0.523 | 27. 81.5% 0.815 | 28. 27.76% 0.2776 | 29. 42.15% 0.4215 | 30. 68.37% 0.6837 |

7 b / MORE FUNDAMENTAL CONCEPTS—PERCENT

Just as we can change percents to fractions and decimals, we can change fractions and decimals to percents. To change a fraction to a percent, change the fraction to an equivalent fraction with a denominator of 100. Then write this fraction as a percent.

To change $\frac{3}{4}$ to a fraction with a denominator of 100, divide 4 into 100 and multiply the quotient by 3. The product is the numerator of the fraction; 100 is the denominator.



EXAMPLE

Change $\frac{13}{25}$ to a percent.

$$\frac{13}{25} = \frac{(100 \div 25) \times 13}{100} = \frac{4 \times 13}{100} = \frac{52}{100} = 52\%$$

EXAMPLE

Change $\frac{3}{8}$ to a percent.

$$\frac{3}{8} = \frac{(100 \div 8) \times 3}{100} = \frac{12.5 \times 3}{100} = \frac{37.5}{100} = 37.5\%$$

To change a decimal to a percent, first write the decimal as a fraction. Then change the fraction to a percent.

EXAMPLE

Change 0.49 to a percent.

$$0.49 = \frac{49}{100} = 49\%$$

EXAMPLE

Change 0.924 to a percent.

$$0.924 = \frac{924}{1000} = \frac{92.4}{100} = 92.4\%$$

EXERCISES Change these fractions to percents.

- | | | | | |
|------------------------|---------------------------|-------------------------|------------------------|------------------------------|
| 1. $\frac{1}{2}$ 50% | 2. $\frac{3}{4}$ 75% | 3. $\frac{9}{10}$ 90% | 4. $\frac{7}{10}$ 70% | 5. $\frac{3}{20}$ 15% |
| 6. $\frac{2}{3}$ 66.7% | 7. $\frac{51}{200}$ 25.5% | 8. $\frac{81}{300}$ 27% | 9. $\frac{18}{75}$ 24% | 10. $\frac{125}{1000}$ 12.5% |

Change these decimals to percents.

- | | | | | |
|---------------|-----------------|-----------------|-----------------|-------------------|
| 11. 0.33 33% | 12. 0.47 47% | 13. 0.54 54% | 14. 0.06 6% | 15. 1.75 175% |
| 16. 2.02 202% | 17. 0.473 47.3% | 18. 0.526 52.6% | 19. 0.625 62.5% | 20. 0.7009 70.09% |

7 C / FUNDAMENTAL CONCEPTS—PROPORTION

When two rates are equal, we have a proportion.

EXAMPLES

$$\frac{1}{2} = \frac{3}{6} \quad \frac{1}{8} = \frac{3}{24} \quad \frac{1}{3} = \frac{4}{12} \quad \frac{3}{4} = \frac{6}{8} \quad \frac{1}{6} = \frac{5}{30}$$



The second ratio reduced to lowest terms is the first ratio.

If two fractions (ratios) are equal, as in a proportion, the cross products are equal.

$$\frac{2}{3} = \frac{6}{9}$$

$$\frac{2}{3} \times \frac{6}{9}$$

$$2 \times 9 = 3 \times 6$$

$$18 = 18$$

Here is where the idea of ratio as a comparison is important. The process of finding the missing value in a proportion can be very useful. For instance, if a student knew that it cost approximately \$45 for three tires, he could quickly find an approximate cost for five tires using proportion.

Similarly, if we have two fractions whose cross products are equal, we know that we have a proportion.

$$\frac{3}{4} \times \frac{6}{8}$$

$$3 \times 8 = 4 \times 6$$

$$24 = 24$$

$$\text{So, } \frac{3}{4} = \frac{6}{8}$$

By using cross products, we can find a missing value in a proportion.

EXAMPLE

Find the missing value in this proportion.

$$\frac{5}{6} = \frac{?}{12}$$

Check:

$$\frac{5}{6} \times \frac{10}{12}$$

$$5 \times 12 = 6 \times ?$$

$$5 \times 12 = 6 \times 10$$

$$60 = 6 \times ?$$

$$60 = 60$$

Since $60 = 6 \times 10$, the missing value is 10.

If students can handle simple equations, solve the proportions using equations.

EXERCISES Find the missing values in these proportions.

1. $\frac{1}{3} = \frac{5}{?}$ 15

2. $\frac{1}{2} = \frac{?}{20}$ 10

3. $\frac{2}{5} = \frac{?}{20}$ 8

4. $\frac{3}{4} = \frac{12}{?}$ 16

5. $\frac{5}{?} = \frac{30}{42}$ 7

6. $\frac{?}{9} = \frac{24}{54}$ 4

7. $\frac{?}{14} = \frac{40}{56}$ 10

8. $\frac{13}{?} = \frac{39}{117}$ 39

9. $\frac{?}{10} = \frac{13}{5}$ 26

10. $\frac{40}{?} = \frac{10}{8}$ 32

11. $\frac{48}{16} = \frac{?}{1}$ 3

12. $\frac{64}{8} = \frac{32}{?}$ 4

13. $\frac{?}{21} = \frac{6}{42}$ 3

14. $\frac{144}{12} = \frac{?}{1}$ 12

15. $\frac{5}{?} = \frac{125}{625}$ 25

In working problems involving percent, we usually use the following equation.

$$(\text{percent}) \times (\text{total amount}) = (\text{percentage}) \quad \text{or} \quad P \times A = R$$

We can use this equation regardless of which value is missing. Suppose we know the total amount and the percentage and want to find the percent: What percent of 8 is 3? First write the given values in the equation.

$$(\text{percent}) \times 8 = 3 \quad \text{or} \quad P \times 8 = 3$$

Then solve the equation for P and write the answer as a percent.

$$P = \frac{3}{8} = \frac{375}{1000} = \frac{37.5}{100} = 37.5\%$$

So, 37.5% of 8 is 3.

EXAMPLE

What percent of 216 is 168?

$$P \times 216 = 168$$

$$P = \frac{168}{216}$$

$$P = \frac{777}{1000} = \frac{77.7}{100} = 77.7\%$$

■ So, 77.7% of 216 is 168.

EXAMPLE

What percent of 1900 is 380?

$$P \times 1900 = 380$$

$$P = \frac{380}{1900}$$

$$P = \frac{20}{100} = 20\%$$

■ So, 20% of 1900 is 380.

Percent	Decimal	Common Fraction
5%	0.05	$\frac{1}{20}$
$6\frac{1}{4}\%$	0.0625	$\frac{1}{16}$
$8\frac{1}{3}\%$	$0.08\frac{1}{3}$	$\frac{1}{12}$
10%	0.1	$\frac{1}{10}$
$12\frac{1}{2}\%$	0.125	$\frac{1}{8}$
$16\frac{2}{3}\%$	$0.16\frac{2}{3}$	$\frac{1}{6}$
20%	0.2	$\frac{1}{5}$
25%	0.25	$\frac{1}{4}$
30%	0.3	$\frac{3}{10}$
$33\frac{1}{3}\%$	$0.33\frac{1}{3}$	$\frac{1}{3}$
$37\frac{1}{2}\%$	0.375	$\frac{3}{8}$
40%	0.4	$\frac{2}{5}$
50%	0.5	$\frac{1}{2}$
60%	0.6	$\frac{3}{5}$
$62\frac{1}{2}\%$	0.625	$\frac{5}{8}$
$66\frac{2}{3}\%$	$0.66\frac{2}{3}$	$\frac{2}{3}$
70%	0.7	$\frac{7}{10}$
75%	0.75	$\frac{3}{4}$
80%	0.8	$\frac{4}{5}$
$83\frac{1}{3}\%$	$0.83\frac{1}{3}$	$\frac{5}{6}$
$87\frac{1}{2}\%$	0.875	$\frac{7}{8}$
90%	0.9	$\frac{9}{10}$
100%	1	

EXERCISES Find these percents.

- What percent of 300 is 100? **33.3%**
- What percent of 207 is 92? **44.4%**
- What percent of 150 is 45? **30%**
- What percent of 352 is 64? **18.18%**
- What percent of 451 is 205? **45.45%**
- What percent of 455 is 210? **46.15%**
- What percent of 410 is 38? **9.27%**
- What percent of 129 is 68? **52.7%**
- What percent of 186 is 78? **41.9%**
- What percent of 322 is 95? **29.5%**
- What percent of 762 is 33? **4.33%**

7 e / PERCENTAGE

Suppose we know the percent and total amount and want to find the percentage: 35% of 1500 is what? First write the given values in the equation.



$$(\text{percent}) \times (\text{total amount}) = (\text{percentage})$$

$$35\% \times 1500 = (\text{percentage})$$

or

$$35\% \times 1500 = R$$

Change the percent to a decimal.

$$0.35 \times 1500 = R$$

And multiply.

$$525 = R$$

So, 35% of 1500 is 525.

EXAMPLE

What is 6% of 250?

$$6\% \times 250 = R$$

$$0.06 \times 250 = R$$

$$15 = R$$

■ So, 6% of 250 is 15.

EXAMPLE

What is 0.5% of 338?

$$0.5\% \times 338 = R$$

$$0.005 \times 338 = R$$

$$1.69 = R$$

■ So, 0.5% of 338 is 1.69.

EXERCISES Find these percentages.

1. 3% of 297 **8.91**

2. 7% of 416 **29.12**

3. 25% of 1200 **300**

4. 48% of 752 **360.96**

5. 66% of 223 **147.18**

6. 91% of 1000 **910**

7. 32.4% of 6 **1.944**

8. 41.3% of 8 **3.304**

9. 0.7% of 55 **0.385**

10. 0.4% of 72 **0.288**

11. 8.6% of 63 **5.418**

12. 5.2% of 45 **2.34**

Suppose we know the percent and the percentage and want to find the total amount: 13% of what is 26? First write the given values in the equation.

$$13\% \times (\text{total amount}) = 26$$

or

$$13\% \times A = 26$$

Change the percent to a decimal.

$$0.13 \times A = 26$$

And solve the equation for A.

$$A = \frac{26}{0.13}$$

$$A = 200$$

So, 13% of 200 is 26.

EXAMPLE

2% of what is 3?

$$2\% \times A = 3$$

$$0.02 \times A = 3$$

$$A = \frac{3}{0.02}$$

$$A = 150$$

■ So, 2% of 150 is 3.

EXAMPLE

0.5% of what is 178.5?

$$0.5\% \times A = 178.5$$

$$0.005 \times A = 178.5$$

$$A = \frac{178.5}{0.005}$$

$$A = 35\,700$$

■ So, 0.5% of 35 700 is 178.5.

EXERCISES Find these total amounts.

1. 40% of what is 78? **195**

3. 140.25 is 51% of what? **275**

5. 0.052 is 2% of what? **2.6**

7. 27% of what is 88.02? **326**

9. 190% of what is 26.6? **14**

2. 20% of what is 165? **825**

4. 61.294 is 11.3% of what? **542.42**

6. 0.112 is 0.4% of what? **28**

8. 43% of what is 75.68? **176**

10. 125% of what is 1000? **800**

REVIEW / PERCENT, RATIO, AND PROPORTION

MIXED PROBLEMS

Find the missing values.

- $5\% = \frac{5}{100} = \frac{1}{20}$
- $\frac{3}{25} = \frac{(100 \div 25) \times 3}{100} = \frac{4 \times 3}{100} = \frac{12}{100} = 12\%$
- $87.5\% = \frac{87.5}{100} = \frac{875}{1000} = \frac{7}{8}$
- $0.005\% = \frac{0.005}{100} = \frac{0.05}{10000} = 0.00005$
- $3.26 = \frac{326}{100} = 326\%$
- $12.5\% = \frac{12.5}{100} = \frac{125}{1000} = 0.125$

Find these missing values.

- $\frac{5}{6} = \frac{20}{24}$
- $\frac{7}{8} = \frac{49}{56}$
- $\frac{13}{25} = \frac{39}{75}$
- $\frac{38}{75} = \frac{190}{375}$

Find the percent, percentage, or total amount.

- What percent of 487 is 80? **16.4%**
- 49% of 742 is what? **363.58**
- 75% of what is 281.25? **375**
- 10% of 5346 is what? **534.6**
- 0.7% of 254 is what? **1.778**
- What percent of 7535 is 42? **0.6%**
- What percent of 899 is 263? **29.3%**
- 280% of what is 120.4? **43**
- 63% of 45 is what? **28.35**
- 23% of what is 100.74? **438**

WORD PROBLEMS

- The Rhodes Department Store was advertising the following sale items.

Women's Skirts and Blouses	40% off
Women's Swim Suits	50% off
Men's Sport Shirts	20% off
Men's Jackets	25% off

Blouses: \$4.17 each; Swim suit: \$11.75; Shirts: \$6.00 each

Carol decided to shop for clothes for her husband and herself. She bought three blouses that originally sold for \$6.95 each, a swim suit that was originally priced

at \$23.50, and two men's sport shirts that were originally \$7.50 each. How much did she pay for each item? What was the total amount she spent?

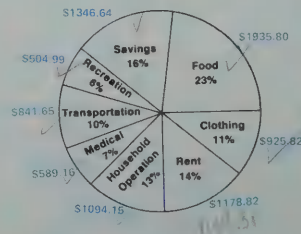
Total \$36.26

- Dolores works in the billing department of A. J. Farnsworth Electrical Supplies. She prepared the following invoice.

Quantity	Description	Unit Price	Extension	Discount	Total
74	Transistor	\$20.73	\$1534.02	30%	\$1073.81
65	Capacitor	29.35	1907.75	25%	1430.81
82	Connector	17.84	1462.88	28 1/2%	1045.96
106	Switch	14.67	1555.02	40%	933.01
98	Wire stripper	5.94	582.12	22%	454.05
125	Insulator	10.42	1302.50	40%	781.50

Find the missing values on the invoice. [Extension = Quantity $\times$ Unit Price; Total = Extension - (Discount $\times$ Extension)]

- Jacque's Tours has several limousines for taking tours around Quebec City. One of their most popular tours is 48 kilometres long. One car can make three 48-kilometre tours on twelve litres of gas; another car can make four 48-kilometre tours on twelve litres of gas; and a third car can make three 48-kilometre tours on sixteen litres of gas. How many litres of gas will be needed for each car for 336 kilometres of travel? [Use proportions.] **First: 28 litres; Second: 21 litres; Third: 37 1/3 litres**
- Bill and Joanne budget Bill's salary using percents.



If Bill's yearly take-home pay is \$8416.50, how much is each item in their budget in dollars and cents?

5. The employees at MacDonald, Ltd. receive yearly raises based on their position, ability, and length of employment. The table below shows last year's and this year's weekly salaries for one department.

	Employee	Weekly Salary Last Year	Weekly Salary This Year
4.9%✓	Davis	\$82.00	\$86.00
7.4%✓	Wilson	\$81.50	\$87.50
5.6%✓	Feinstein	\$87.00	\$91.85
10.2%✓	Grant	\$94.35	\$104.00
3.1%✓	Holliway	\$106.00	\$109.25
10%✓	Issland	\$114.50	\$126.00

Find the percent increase for each employee. (What percent of last year's weekly salary is each raise?)

6. Six salesmen for Anderson & Associates made the following amounts in commissions for one year.

SALESMAN	COMMISSION
Carter	\$6850 \$40 294.12✓
Laporte	\$7200 \$42 352.94✓
Quincey	\$5925 \$34 852.94 ✓
Reismann	\$6483 \$38 135.29 ✓
Steinberg	\$6278 \$36 929.41
Thorsen	\$5845 \$34 382.35

If the salesmen receive 17% of their sales as commission, how much did each sell?

CHECK YOUR PROGRESS

Change these percents to fractions and to decimal numbers.

1. $33\frac{1}{3}\%$ $\frac{1}{3}$; 0.333 2. 20% $\frac{1}{5}$; 0.2
3. 40% $\frac{2}{5}$; 0.4 4. 65% $\frac{13}{20}$; 0.65

Change the fractions or decimals to percents.

5. 0.6% 60% 6. $\frac{5}{6}$ 83 $\frac{1}{3}\%$
7. 0.715 71.5% 8. $\frac{3}{8}$ 37.5%

Find the missing values in these proportions.

9. $\frac{11}{14} = \frac{44}{56}$ 10. $\frac{5}{12} = \frac{60}{144}$ 11. $\frac{8}{9} = \frac{48}{54}$

Find these percents.

12. What percent of 324 is 35? 10.8%
13. What percent of 7535 is 64? 0.8%
14. What percent of 452 is 848? 187.6%

Find these percentages.

15. 4.8% of 37 1.776
16. 9% of 428 38.52
17. 24.5% of 845 207.025

Find these total amounts.

18. 62% of what is 1729.8? 2790
19. 1760% of what is 211.2? 12
20. 250% of what is 500? 200

Research/Discuss

- Discussion should bring out that all kinds of companies, businesses, and governmental agencies keep data on past records. Analyzing this data to predict wisely for sales, inventory, location of branches, and so on, is the function of a statistician.

CHAPTER 8

BASIC STATISTICS

- Discuss informally the various statistical concepts that apply. These would include: range of weights, middle weight, most common weight, average weight, and so on.
- Statistics can be presented in such a manner that they are deceiving. This is particularly true if the statistical sample is too small, or if it is not a random sample. Besides, conclusions drawn from statistics are really only "educational guesses," not facts.
- You did as well or better than 50% of everyone tested. Discuss other uses of percentiles.
- He means that he feels Toronto would beat Montreal in 2 out of every 3 games they play. Therefore, he will risk \$2 against \$1 that Toronto will win.

RESEARCH/DISCUSS

- Who employs statisticians? What do statisticians do?
- Suppose you know the weights of everyone in your class. What can you learn from this list of data?
- Can you always believe statistics you read in the newspaper? Why?
- Suppose you ranked at the 50th percentile on your English test. How well did you do in relation to your classmates?
- A friend tells you that he will give you two to one odds that Toronto beats Montreal in Saturday's hockey game. What does he mean?

IN THIS CHAPTER YOU WILL LEARN . . .

- how to find the arithmetic average or mean
- how to locate the median and the mode
- how to compute the average when data are grouped
- the basic principles of probability

UNIVERSAL BUSINESS SUPPLY COMPANY, LTD.
COMPARISON OF SALES BY QUARTERS, 1974
WITH SALES BY QUARTERS, 1973

PAGE 64

DIVISION.....OFFICE SUPPLIES
DEPARTMENT.....PRINTED FORMS
LOCATION.....VANCOUVER
QUARTER ENDING.....SEPTEMBER 30, 1974

CH OF ADDRESS	CATALOG CODE	YR	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL
CH OF ADDRESS	Q0599	74	1 795	1 934	1 567*	-	5 296
		73	1 657	1 879	2 134	5 243	10 913
INVENTORY	Q0912	74	5 108	3 101	3 652	-	11 861
		73	7 096	4 491	5 113	7 650	24 350
W/H STATEMENTS	Q1898	74	-	725**	1 943	-	2 668
		73	-	-	-	-	0
CAT INV	Q2150	74	5 040	3 669	3 123	-	11 832
		73	6 929	7 381	6 815	7 101	28 226
DEDUCT	Q3966	74	34 952	33 891	23 756*	-	92 599
		73	30 429	32 523	39 339	44 367	146 458
STOCK TRANSFER	Q4416	74	342	119	21***	-	482
		73	1 092	805	595	415	2 897
SHIPPING	Q6164	74	7 898	4 791	3 768	-	16 457
		73	2 271	3 042	5 984	3 938	15 235
INVOICE	Q6583	74	923	1 069	1 243*	-	3 245
		73	-	-	83**	569	652
PAYROLL	Q7341	74	85 900	92 350	91 754	-	270 004
		73	72 772	77 750	87 589	85 899	324 010
INV & SHIP	Q8642	74	5 361	5 737	5 622	-	16 720
		73	4 154	4 570	4 688	4 656	18 068
TRACER	Q9587	74	290	42***	-	-	332
		73	1 505	1 203	721	310	3,739
STATE IN	Q9785	74	22 987	26 069	20 468	-	69 524
		73	32 388	52 390	37 680	29 491	151 949

* TOTAL NOT COMPLETE

*** PRODUCT WITHDRAWN

** NEW PRODUCT

The high speed with which computers can compile data has made them very useful in preparing business reports within a company.

① A printout like this one for the Printed Forms Department is available for every department.

② Sales can be compared for two years.

③ Because this was a new product in the 2nd quarter of 1975, there are no sales recorded prior to that time.

④ The declining sales history on this product may indicate why it was withdrawn.

⑤ Products are listed by the numerical order of their catalogue code numbers rather than alphabetically by their names.

8 a / THE ARITHMETIC MEAN

One goal of statistics is to collect data. A more important goal is to organize the list of data to find out what it means. Suppose twenty students reported their total summer job incomes as follows:

Explain that this data group would be called an array if the values were listed in order from smallest to largest.

DATA
GROUP
A

\$450, \$384, \$67.50, \$590, \$725,
\$1250, \$263, \$1138, \$175, \$690,
\$157, \$564, \$1087, \$15.25, \$528
\$630, \$162, \$472, \$327, \$500

Can you find the smallest and the largest numbers on this list? One way you can describe this data is to say, "The incomes range from \$15.25 to \$1250."

Another way to organize a list of data is to arrange the values in order. The following chart, called a *frequency distribution*, arranges the incomes above in groups.



The first entry includes \$15.25, \$67.50, \$157, \$162, and \$175.

Point out that this method of tallying was originally devised for counting animals when they were brought in after grazing in the hills. It was also the first method of counting election ballots.

\$0—\$199	
\$200—\$399	
\$400—\$599	I
\$600—\$799	
\$800—\$999	
\$1000—\$1199	
\$1200—\$1399	I



A frequency distribution tells how often (frequently) each value occurs.

Now, at a glance, we can tell that most students earned between \$400 and \$599. We can also tell that no one earned between \$800 and \$999.

Another important way to describe data is to use the *arithmetic mean*, or *average*. To find the mean, add all the listed values. Then divide the sum by the number of values.

Remind students that the horizontal line is a division symbol.

$$\text{Mean} = \frac{\text{Sum of values}}{\text{Number of values}}$$

EXAMPLE

Find the mean for the data above.

We can find the sum by grouping.

\$450.00	\$1250.00	\$157.00	\$630.00
384.00	263.00	564.00	162.00
67.50	1138.00	1087.00	472.00
590.00	175.00	15.25	327.00
725.00	690.00	528.00	500.00
<u>\$2216.50</u>	<u>\$3516.00</u>	<u>\$2351.25</u>	<u>\$2091.00</u>
\$2216.50	3516.00	2351.25	2091.00
\$10 174.75			

Divide the sum by the number of items.

$$\frac{\$10\,174.75}{20} = \$508.74.$$

- The mean (or average) is \$508.74

The example above shows that we can say, “The average summer income of the students with jobs was \$508.74.”

Discussion Question: What uses does the mean have in business?

Consider: Uses in sales—average number of sales per year, per region, per quarter; uses in production—average output per department, per month, per year; uses in pricing price of product as compared to average price of similar products.

Each of these sums is a subtotal; they are the sums of lines one, two, three, and four of Data Group A.

Point out that no student received the average wage.

EXERCISES Find the mean for these data.

1. Ages to the nearest birthday as of June 1 of the employees of the Maple Leaf Manufacturing Company: 18, 19, 20, 20, 21, 21, 21, 21, 22, 24, 25, 25, 25, 25, 26, 28, 29, 29, 30, 33, 34, 38, 42, 45, 46, 47, 47, 49, 55, 62, 63, 65.
33.59 ≈ 34

2. Policies written by the salesmen for the Provincial Life Insurance Company during the month of January in thousands of dollars per salesman: 10.0, 15.25, 18.376, 20.98, 21.0, 24.5, 26.1, 35.75, 42.4, 76.5, 110.5, 155.0.
46.363

3. The prices of top grade butter per 500 grams on September 15 in selected stores in Halifax: \$0.85, \$0.85, \$0.86, \$0.86, \$0.86, \$0.87, \$0.87, \$0.87, \$0.88, \$0.88, \$0.88, \$0.89, \$0.90, \$0.91. \$0.87
4. The daily volume of soft drink sales for the month of July (in millions of kilograms): 9.2, 9.6, 9.9, 10.1, 10.3, 10.5, 10.6, 10.8, 11.0, 12.2, 12.5, 12.7, 13.3, 14.2, 14.5. 11.375 ≈ 11.4

5. Hours worked during the week ending April 10 by the employees of the Ray Vaughn & Joe King Company: 38, 40, 40, 40, 40, 40, 40, 42, 43, 44, 44, 44, 44, 44, 44, 46, 47, 48, 48, 48, 48, 48. 43.6 ≈ 44

6. Scores of students in an accounting examination: 43, 50, 58, 64, 70, 72, 73, 78, 78, 80, 81, 83, 84, 85, 85, 86, 86, 89, 89, 90, 91, 95, 100. 78.69 ≈ 79

Suppose you described some data to a friend by saying, “The test scores ranged from 55 to 95, and the mean was 80.” He would understand that many scores were high, because the mean, 80, is close to the highest score, 95.

Suppose you had said, “The test scores ranged from 55 to 95, and the mean was 62.” Then, he would believe that most scores were low, because 62 is near 55, the lowest score.

But sometimes the mean may be misleading. Let’s find the mean for this data.

DATA GROUP B	1972 fund drive	\$150
	1973 fund drive	\$148
	1974 fund drive	\$2132
	1975 fund drive	\$138

$$\$150 + \$148 + \$2132 + \$138 = \$2568$$

$$\text{Mean} = \frac{\$2568}{4} = \$642$$

It is correct to say that the average or mean amount collected each year in the fund drive was \$642. However, it is deceiving, because this amount is not representative of any year’s total.

Since extremely large or small values unduly influence the mean, it is not always useful as a *measure of central tendency*. Therefore, other measures are available for describing data. Let’s examine this *array* of data showing some weekly wages for construction workers.

DATA GROUP C	\$101.50,	\$101.50,	\$105.00,	\$105.00,	\$105.00,
	\$109.75,	\$109.75,	\$115.40,	\$118.30,	\$125.00,
	\$125.00,	\$125.00,	\$125.00,	\$125.00,	\$140.95,
	\$145.00,	\$150.85,	\$160.35,	\$200.00,	\$240.00

Point out that Data Group C is an array because the values are arranged from smallest to largest.

According to the frequency distribution below, the most frequent wage is \$125. There are five workers who earned that amount. We say the *mode* is \$125.

\$101.50	2 workers	\$140.95	1 worker
\$105.00	3 workers	\$145.00	1 worker
\$109.75	2 workers	\$150.85	1 worker
\$115.40	1 worker	\$160.35	1 worker
\$118.30	1 worker	\$200.00	1 worker
\$125.00	5 workers	\$240.00	1 worker

The *mode* is the value in the data that occurs most often.

For this data, the mean is \$131.67 and the mode is \$125. That is, the average wage for these construction workers is \$131.66. But the wage that most workers earn is \$125.

FACTS AND FIGURES

Of all Canadian provinces, the province with the greatest density is Prince Edward Island with 50.3 persons per square mile. Ontario has a population density of 22.2 persons per square mile. The population density of Canada is 6 persons per square mile.

EXERCISES Find the mode for these arrays.

- Number of years of service of each employee with the company: 2, 3, 5, 7, 9, 13, 13, 13, 14, 14, 15, 16, 16, 18, 23. **13**
- Ages of employees to the nearest birthday: 19, 20, 21, 21, 21, 23, 24, 25, 25, 25, 25, 30, 33, 45, 50. **25**
- Weekly wages of part-time employees for week ending September 21: \$75, \$80, \$85, \$90, \$90, \$90, \$90, \$90, \$95, \$100, \$105, \$115, \$125, \$125. **\$90**
- Hours worked by employees for week ending October 5: 32, 35, 40, 40, 40, 40, 40, 42, 42, 44, 44, 44, 44, 46, 48. **40**
- Years of school completed by each employee: 10, 10, 11, 12, 12, 12, 12, 12, 12, 13, 13, 14, 15, 16, 16.
- Scores of employees on job knowledge test: 70, 72, 72, 78, 80, 84, 85, 85, 88, 88, 88, 88, 90, 95, 98. **88**

Refer to the Exercises on page 69. Note that it is possible for an array to have more than one mode.

- Find the mode for the ages in problem 1. Is there more than one mode? Do you think this helps describe the data?
- Find the mode for the prices in problem 3. Do you think this helps describe the data?
- Find the mode for the hours worked in problem 5. Do you think this helps describe the data?

Project. Find out what kinds of statistics are kept by your school and how they are used.

Answers to Exercises

7. 21, 25; Yes; Yes
8. \$0.86, \$0.87, \$0.88; No
9. 44; Yes



A distribution having more than one mode is called bimodal.

Facts and Figures

Does this mean Prince Edward Island has a larger population than Ontario?

Find the two provinces in a Canadian atlas. Compare the areas of each province and their total population.

How do you explain the fact that Canada's population density is only 6 persons per square mile?

8 C / THE MEDIAN

The concept of the “centre” of a list of data is important because it helps us understand the data without examining each value. The mean is a *computational* average, because it must be computed. It is based on the *size* of the values in the distribution. The mode is a *positional* average, because it is selected on the basis of its frequency without regard to size. Another positional average is the *median*.

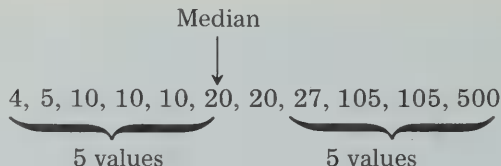


The *median* is a positional measure of central tendency that divides the data in half.

Percentile scores are used frequently in national tests. The median is the 50th percentile. Thus, a student who has a median test score has done as well or better than 50% of all who were tested.

There are as many values above the median value as there are values below it. The size of each value is not significant. They are all counted equally. In the array below there are 11 values arranged in order from smallest to largest. The median is the value in the middle.

DATA
GROUP
D



In Data Group C on page 70, there are 20 values. Therefore, there are two numbers in the middle—not just one. In this case, the numbers are the same, both are \$125. So, \$125 is the median value. If they had been different, then the median would simply be the average of these two middle values.



- In an array with an odd number of values, there is just *one* middle value.
- In an array with an even number of values, there are *two* middle values.

EXAMPLE

Describe the data in Data Group D.

The eleven values range from 4 to 500.

$$\text{Mean} = \frac{816}{11} = 74.2$$

$$\text{Mode} = 10$$

$$\text{Median} = 20$$

Show how the 500 value has unduly influenced the mean by having students compute the mean without the 500 value. (Mean = $\frac{316}{10} = 31.6$)

When the mean, median, and mode have nearly the same value, the data is usually well balanced about its centre value. Consider the array shown below.

DATA
GROUP
E

1, 2, 2, 3, 4, 4, 4, 5, 5, 5, 5, 6, 6, 6, 7, 8, 8, 9

If we rearrange these values, it is easy to see that they are balanced evenly around the centre.

1	2	3	4	5	6	7	8	9
	2		4	5	6		8	
			4	5	6			
				5				

Thus, we would suspect that the mean, median, and mode would have nearly the same value.

$$\text{Mode} = 5$$

$$\text{Median} = 5$$

$$\text{Mean} = \frac{90}{18} = 5$$

FACTS AND FIGURES

The Royal Canadian Mounted Police has a combined total of 11 000 persons responsible for enforcing Federal Laws throughout Canada. They also enforce Provincial Statutes and the Criminal Code in all Provinces except Ontario and Quebec. Ontario and Quebec have a combined total of 7000 Provincial Police Officers, while the over 600 municipalities in Canada contribute an additional 23 000 persons.

Project: Gather various data on the students in your class, such as weights, heights, attendance, family size, and grade point averages. Then describe the data using the various measures of central tendency.

Fact and Figures

Why do Ontario and Quebec also have provincial police officers? Find the population of Canada in 1971. How many police officers were there for every 100 000 Canadians? If there were 1 186 252 criminal code offences in 1971, how many offences did each police officer handle on the average?

Find the medians for these arrays.

- Annual salaries of city managers in cities with populations from 25 000 to 200 000: \$18 000, \$18 750, \$19 000, \$19 500, \$20 000, \$21 000, \$21 500, \$22 000, \$25 000, \$26 500. **\$20 500**
- Ages of school principals in one Alberta city: 28, 29, 30, 30, 32, 33, 33, 35, 36, 38, 38, 40, 43, 45, 49. **35**
- Number of charge sales per week for 11 consecutive weeks: 562, 574, 579, 595, 601, 613, 623, 632, 640, 655, 658. **613**
- Retail prices per dozen of Grade A Large eggs in Vancouver supermarkets: \$0.53, \$0.55, \$0.55, \$0.55, \$0.56, \$0.56, \$0.57, \$0.57, \$0.57, \$0.58, \$0.58, \$0.59, \$0.60, \$0.61. **\$0.57**
- Number of employees absent from work due to illness on each of 17 consecutive business days: 1, 2, 2, 3, 3, 3, 4, 4, 4, 5, 5, 6, 7, 7, 9, 9, 11. **4**
- Number of return sales on each of 10 consecutive business days: 2, 3, 3, 4, 5, 5, 7, 8, 9, 9. **5**

8d / THE MEAN FROM GROUPED DATA

In selecting class intervals, several ideas should be mentioned:

- (1) Every value in the data should be included in a class interval.*
- (2) No value should be in more than one class interval.*
- (3) The class intervals should all be the same length.*

Point out that it is not necessary to begin with the smallest value and end with the largest value. This data could also have been divided into 10 class intervals with 15 values in each class interval. The first interval could include weights from 85 kilograms to 99 kilograms; the last interval, weights from 220 kilograms to 234 kilograms.



There are 15 consecutive values in each class interval.

All weights from 91 kilograms to 105 kilograms inclusive will be counted in the first class interval. All weights from 106 kilograms to 120 kilograms inclusive will be counted in the second class interval.

Next, we find the midpoint of each interval.

The midpoint is the average of the upper and lower values of each class interval.

We record the number of weights in each class interval (called the *class frequency*) and find the products of the class frequencies and the midpoints.

Now, we can find the mean. We simply divide the sum of the values in the $(f \times x)$ column by the sum of the values in the class frequency column.

$$\text{Mean} = \frac{197\,730}{1365} = 144.9$$

The mean weight is 144.9 kilograms.

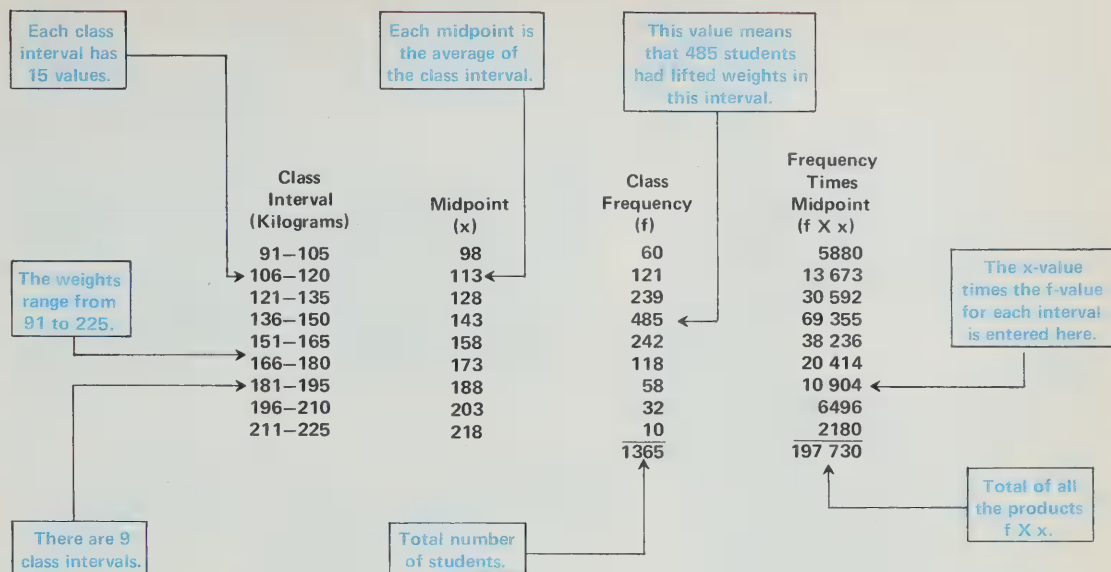
When data consists of a large number of values, it is quicker, and just as meaningful to compute the mean by grouping the data. Suppose the weight-lifting department of the physical education department of a community college has recorded the maximum weights lifted by all 1365 of its male students. How can we analyze these weights? To find the mean, we can add all 1365 weights. However, there is a quicker way.

Suppose 91 is the lowest weight and 225 is the highest weight. Then, we can divide the weights into 9 groups, with 15 values in each group. Each group is called a *class interval*. The class intervals would be

Class Interval (Kilograms)	Midpoint (x)	Frequency (f)	Frequency Times Midpoint ($f \times x$)
91–105			
106–120			
121–135			
136–150			
151–165			
166–180			
181–195			
196–210			
211–225			

Point out that in this type of distribution, called a normal distribution, the mean, mode and median will be very nearly equal.





EXERCISES Find these means by grouping the data.

1. The prices of television sets sold at the Hodgkins TV and Radio Shop in November. **\$412.40**
3. The sales for the salesmen of the Anco Company Ltd. for the month of March. **\$1855.76**

CLASS INTERVAL (DOLLARS)	NUMBER OF SETS SOLD
\$201-\$300	9
\$301-\$400	10
\$401-\$500	13
\$501-\$600	8
\$601-\$700	2

2. The prices of men's suits sold at Brill's Boulevard Store in April. **\$77.12**

CLASS INTERVAL (DOLLARS)	NUMBER OF SUITS SOLD
\$50.01-\$60	14
\$60.01-\$70	15
\$70.01-\$80	17
\$80.01-\$90	13
\$90.01-\$100	8
\$100.01-\$110	6
\$110.01-\$120	3

CLASS INTERVAL (SALES)	NUMBER OF SALESMEN
\$1501-\$1600	1
\$1601-\$1700	2
\$1701-\$1800	3
\$1801-\$1900	6
\$1901-\$2000	4
\$2001-\$2100	2
\$2101-\$2200	1

4. The sales for the salesmen at Barton's Furniture Company for one week in May. **\$522.17**

CLASS INTERVAL (SALES)	NUMBER OF SALESMEN
\$401-\$450	2
\$451-\$500	3
\$501-\$550	5
\$551-\$600	4
\$601-\$650	1

Statistics can be used to make predictions for the future. When the weatherman reports, "There is an 80% chance of rain today," he is using both statistics and probability. He knows from past records how many times it has rained when the climatic conditions are like they are today (8 times out of 10). He uses probability to predict whether it will rain today (80% chance). The weatherman is also saying that with these same climatic conditions, it does *not* rain 2 times out of 10. That is, there is a 20% chance that it will *not* rain today. The only thing that is certain is that it either will or will not rain today.

In the life insurance business, predictions can be surprisingly accurate. The life insurance actuary, knowing from vital statistics the number of deaths by ages for each year, uses mathematical probability to compute life insurance rates.

The probability of an event happening is the ratio of the favourable occurrences to the total number of possible occurrences. That is,

$$\text{Probability} = \frac{\text{number of favourable occurrences}}{\text{total number of possible occurrences}}$$

Probability is a ratio.



Bring pennies, dice, and playing cards to class for experimentation. One possible experiment would be to have 15 or 20 students each toss a coin 30 times, keeping tallies of the results. This will give up to 600 tosses of which about one-half will be heads.

We can use coins, dice, or playing cards to illustrate how this formula is used.

EXAMPLE

Find the probability of tossing heads with one flip of a coin.

The coin has two sides so the total number of possible occurrences is 2. One of these is "favourable".

$$\frac{\text{favourable occurrences}}{\text{total possible occurrences}} = \frac{1}{2}$$

- The probability of tossing heads is $\frac{1}{2}$.

Point out that die is singular and dice is plural.

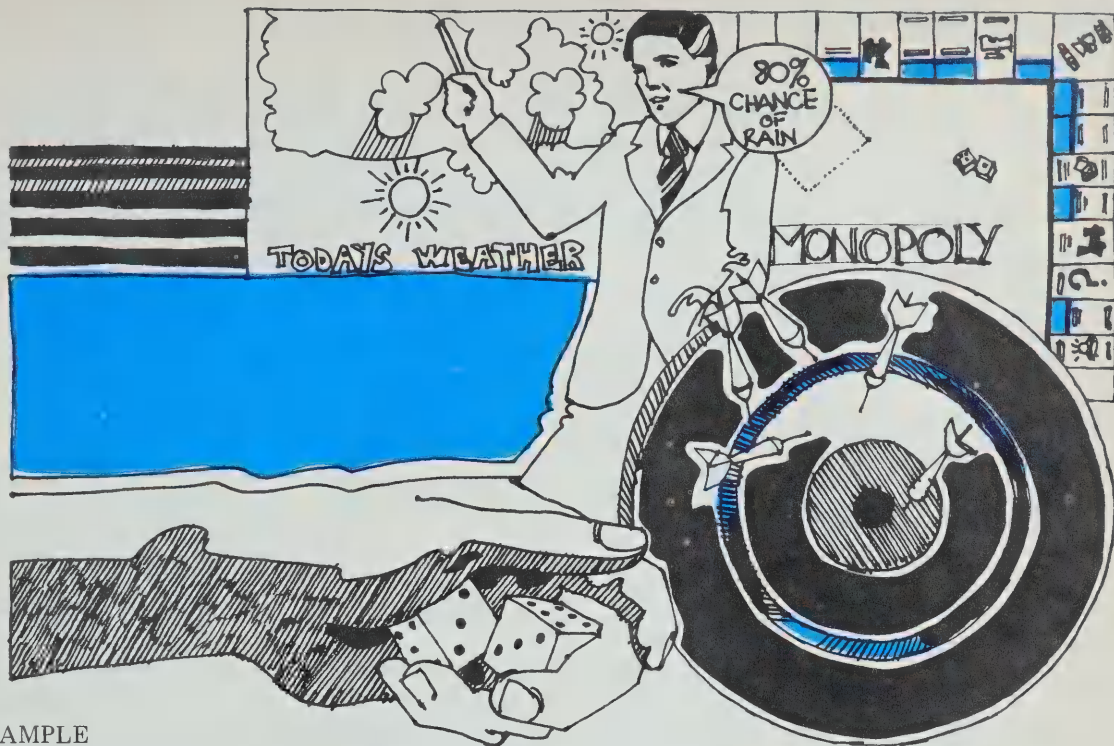
EXAMPLE

Find the probability of throwing a six with one roll of a die.

Since the die has six sides numbered from 1 through 6, there are six possible occurrences.

$$\frac{\text{favourable occurrences}}{\text{total possible occurrences}} = \frac{1}{6}$$

- The probability of throwing a six is $\frac{1}{6}$.



EXAMPLE

Find the probability of selecting the ace of spades with one draw from a deck of 52 playing cards.

$$\frac{\text{favourable occurrences}}{\text{total possible occurrences}} = \frac{1}{52}$$

- The probability of selecting the ace of spades is $1/52$.

EXAMPLE

Find the probability of selecting a red ball with one draw from a bag that contains 5 red balls and 8 black balls.

Since there are 5 red balls and 8 black balls, there are 13 possible occurrences. We hope to draw a red ball, so there are 5 favourable occurrences.

$$\frac{\text{favourable occurrences}}{\text{total possible occurrences}} = \frac{5}{13}$$

- The probability of selecting a red ball is $5/13$.

EXERCISES Find the probability for the occurrence of each event on the first trial.

1. Tossing an even number with a single die. $1/2$
2. Drawing any one of the four aces from a deck of playing cards. $1/13$
3. Drawing any one of the 13 spades from the deck of playing cards. $1/4$
4. Drawing a red card (either hearts or diamonds) from the deck. $1/2$
5. Drawing any face card (jack, queen, or king) from the deck. $3/13$
6. Drawing a black face card from the deck. $3/26$

8 f / MATHEMATICAL PROBABILITY

If the symbol $P(A)$ stands for the probability that A will happen, then the probability that A will *not* happen is $P(\text{not } A)$. This is the ratio of the unfavourable occurrences to the total number of possible occurrences.

$$P(\text{not } A) = \frac{\text{number of unfavourable occurrences}}{\text{total number of possible occurrences}}$$

For example, if the event A is “drawing the ace of spades,” then $P(A) = 1/52$. The probability of A not happening, “*not* drawing the ace of spades,” is $51/52$. This is because there are 51 unfavourable occurrences out of 52 possible occurrences.



The sum of the two probabilities, $P(A) + P(\text{not } A)$, is

$$1/52 + 51/52 = 52/52 = 1.$$

A probability of 1 is certainty. The ace will either be drawn or it will not be drawn.

It is possible to find the probability that an event will not occur, $P(\text{not } A)$, by subtracting the probability that it will occur from one.

$$P(\text{not } A) = 1 - P(A)$$

For example, if the probability of drawing any diamond from a pack of cards is $13/52 = 1/4$, then the probability of *not* drawing a diamond is $1 - 1/4 = 3/4$.

Since a probability of 1 is certainty, a probability of 0 is impossibility. An example of 0-probability is to roll a 7 with a single die numbered from 1 through 6.

For an interesting argument, ask the class what the probability is that two people in the class will have the same birthday. If the class is larger than 23 people, the probability is greater than $1/2$. The probability that at least two people have the same birthday is one minus the probability that they all have different birthdays. For a class of 23,

$$P = 1 - \frac{365 \times 364 \times \dots \times 343}{(365)^{22}} \\ \approx 1 - 0.492 \approx 0.508$$

$$\frac{\text{favourable occurrences}}{\text{total possible occurrences}} = \frac{0}{6} = 0$$

EXERCISES Find the probability of each event *not* happening on the first trial.

1. Tossing a head with a coin. $1/2$
2. Drawing the queen of spades. $51/52$
3. Drawing any jack. $12/13$

4. Rolling a five with a single die. $5/6$
5. Rolling a two or a five with a single die. $2/3$
6. Rolling an even number with a single die. $1/2$

Independent events in probability occur at the same time. However, the favourable occurrence of one event does not depend on any other event. For example, tossing heads on a coin and rolling a six on a die are independent events—the favourable occurrence of one does not depend on the other. The probability of the favourable occurrence of two independent events, $P(A \text{ and } B)$, is the *product* of their separate probabilities.

$$P(A \text{ and } B) = P(A) \times P(B)$$

EXAMPLE

Suppose you have one coin and one six-sided die. Find the probability of tossing heads and rolling a six at the same time.

Probability of tossing heads = $P(A) = \frac{1}{2}$

Probability of rolling six = $P(B) = \frac{1}{6}$

Probability of both occurring = $P(A \text{ and } B)$
 $= \frac{1}{2} \times \frac{1}{6}$
 $= \frac{1}{12}$

Discussion Question. Where is probability used most often in everyday life? How is it used with statistics to predict events?

Consider. All forms of betting, the numbers games, card games, life insurance and other forms of insurance, weather, traffic and city planning, market research, and so on.

FACTS AND FIGURES

In the 1972 general election, 75% of the eligible voters in Canada elected 109 Liberals, 107 Progressive Conservatives, 31 members of the New Democratic Party, 15 Social Credit members, and 2 Independents. In that election, a total of 9 678 741 Canadians exercised their right to vote.

In 1968, 75.6% of the eligible voters in Canada elected 155 Liberals, 72 Progressive Conservatives, 22 New Democratic Party members, and 15 Social Credit and Independents. 10 860 798 Canadians voted in that election.

Facts and Figures

(1) Did the eighteen-year-old population influence the election results in 1972?

(2) How many eligible Canadian voters did not vote in 1968? 1972?

EXERCISES Find the probabilities of these independent events occurring at the same time.

1. Flipping a coin and drawing a card from the deck so that the coin is tails and a spade is drawn. $\frac{1}{8}$
2. Flipping a coin and rolling a die so that the coin is heads and the die is an odd number. $\frac{1}{4}$
3. Rolling a pair of dice so that each shows a six. $\frac{1}{36}$
4. Flipping two coins so that each turns up heads. $\frac{1}{4}$
5. Flipping three coins so that each turns up tails. $\frac{1}{8}$
6. Rolling three dice so that each shows the number one. $\frac{1}{216}$

REVIEW / BASIC STATISTICS

CHECKLIST

Array (p. 70)
Average (p. 68)
Class frequency (p. 74)
Class interval (p. 74)
Data (p. 68)
Frequency distribution (p. 68)
Independent events (p. 79)
Mean (p. 68)
Measure of central tendency (p. 70)
Median (p. 72)
Midpoint (p. 74)
Mode (p. 70)
Probability (p. 76)

PROBLEMS

In problems 1 through 6, find the arithmetic mean for the data.

1. Beginning job salaries per month for college graduates according to major fields of study: Science, \$900; Business and Commerce, \$875; Social Sciences, \$875; Humanities, \$715; Liberal Arts, \$675. **\$808.**
2. Average prices of a hamburger for the past 14 years: \$0.25, \$0.30, \$0.35, \$0.40, \$0.45, \$0.50, \$0.50, \$0.55, \$0.60, \$0.65, \$0.65, \$0.70, \$0.70, \$0.75. **\$0.53**
3. Population of the 8 largest cities in Canada (in thousands): 2628, 2743, 1082, 540, 498, 403, 480, 450. **1103**
4. Property tax rates of the 9 largest cities in Ontario per \$1000 assessed value: \$102.50, \$100.80, \$99.70, \$97.80, \$95.20, \$94.80, \$94.00, \$93.60, \$93.20. **\$96.84**
5. Stock dividends per share paid by the Octopus Corporation for the last 8 years: \$2.00, \$2.10, \$2.25, \$2.25, \$2.30, \$2.40, \$2.40, \$2.50. **\$2.28**
6. Interest rates paid by chartered banks in Canada for 5-year term deposits for the past 5 years: 8.25%, 7.75%, 6.75%, 5.50%, 4.75%. **6.60%**

In problems 7 through 12, find the medians.

7. Use the data for problem 1. **\$875.**
8. Use the data for problem 2. **\$0.53**
9. Use the data for problem 3. **\$419.**
10. Use the data for problem 4. **\$95.20**

11. Use the data for problem 5. **\$2.28**
12. Use the data for problem 6. **6.75%**

In problems 13 through 16, find the mean from the grouped data in the frequency distributions.

13. Ages of the employees of the Starlight Corporation as of July 1. **39.38 $\approx$ 40**

CLASS INTERVAL (YEARS)	NUMBER OF EMPLOYEES
18-24	23
25-31	32
32-38	45
39-45	31
46-52	26
53-59	18
60-66	15

14. Sales for the month of February by salesmen of the John Smith Company. **\$2455.05**

CLASS INTERVAL (DOLLARS)	NUMBER OF SALESMEN
\$2001-\$2200	3
\$2201-\$2400	5
\$2401-\$2600	9
\$2601-\$2800	4
\$2801-\$3000	1

15. Sales tags sold in one day at Fannie's Fashions. **\$21.77**

CLASS INTERVAL (DOLLARS)	NUMBER OF SALES TAGS
\$00.00-\$25.00	7
\$26.00-\$50.00	4

16. Scores of civil service employees on a promotional examination. **96.69 $\approx$ 97**

CLASS INTERVAL (SCORES)	NUMBER OF EMPLOYEES
71-80	16
81-90	27
91-100	34
101-110	29
111-120	15
121-130	5

Roulette is a gambling game played with a wheel that has 38 slots around the perimeter. The slots are numbered 1 through 36, 0, and 00. The odd numbers are red and the even numbers are black. The 0 and 00 are green. The operator of the game spins the wheel and tosses a ball around the spinning wheel. When the wheel stops, the ball falls in one of the slots. Bets are made on single numbers, combinations of numbers, on red or black, and on odd or even. In problems 17 through 24, find the probability of the occurrence of the event on one spin of the roulette wheel.

17. Selecting any one number to win. $\frac{1}{38}$
18. Winning if two adjacent numbers are selected. $\frac{1}{19}$
19. Winning if a block of four numbers is selected. $\frac{2}{19}$
20. Winning if the first twelve numbers are selected. $\frac{6}{19}$
21. Winning if red is chosen; if black is chosen. $\frac{9}{19}$; $\frac{9}{19}$
22. Winning if odd is chosen; if even is chosen. $\frac{9}{19}$; $\frac{9}{19}$
23. Winning on red two consecutive times; on black two consecutive times. $\frac{81}{361}$; $\frac{81}{361}$
24. Winning two consecutive times on a single number. $\frac{1}{1444}$

In problems 25 through 26, find the probability for a person in these situations.

25. In a city with a population of 63 000, the health authorities estimate that there will be approximately 9450 people who will contract influenza during the winter season. What is the probability of a resident having influenza? 15%
26. Out of 1650 applicants to an Eastern University, only 300 will be accepted for admission. What is the probability that an applicant will be selected for admission? $\frac{2}{11}$

QUESTIONS

1. How do you define the mean, the mode, and the median?
2. What effect do very high or very low values have on the median?
3. How do you find the mean from grouped data?
4. What is a frequency distribution?
5. How do you determine the midpoint of a class interval in a frequency distribution?
6. How do you define mathematical probability?
7. If you know the probability that an event will happen, how do you find the probability that it will not happen?
8. How do you define certainty?

GRAPHS

CHAPTER 9

Research/Discuss

- ☐ The first three questions are designed to make students think about how they learn. Discussion should bring out several ideas: seeing and hearing are the two most common senses used in learning; we remember better if we see something rather than just hear it; the more senses used in learning the better the learning.
- ☐ This question should be returned to again and again throughout the chapter as students learn some of the characteristics of data and graphs.
- ☐ Try to get students to think of ways to graph this data. Help them see that they would use different graphs depending on whether they compare the weights by age, height, sex, or whatever.

RESEARCH/DISCUSS

- ☐ Explain the old proverb, "One picture is worth a thousand words."
- ☐ Which of your five senses are most effective for learning purposes?
- ☐ Find out what psychologists mean when they say, "Multi-sensory appeals facilitate learning."
- ☐ What are some topics that can be easily explained by graphs? What are some that are difficult to explain by graphs?
- ☐ Suppose you know the weights of everyone in your class. How could you show this data visually?

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ how to read, interpret, and construct line graphs
- ☐ techniques for good graphic presentation
- ☐ how to present data using pie charts, histograms, and bar graphs

Government Revenue and Expenditure (Fiscal Year 1971-72 Interim)

Table C11

Revenue

Personal Income Tax	\$1 022 100 000
Retail Sales Tax	760 000 000
Health Insurance Premiums	560 200 000
Corporation Taxes	420 000 000
Gasoline Tax	391 000 000
Liquor Control Board	210 000 000
Other	819 900 000

TOTAL NET GENERAL REVENUE

\$4 183 200 000

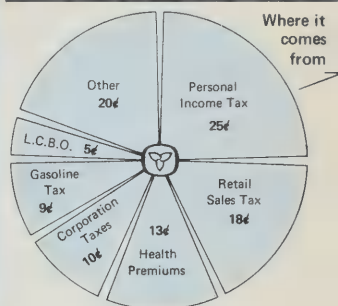
Expenditure

Education, Colleges, and Universities	\$1 785 000 000
Health and Social Services	1 352 100 000
Transportation and Communications	587 000 000
Other	1 111 600 000

TOTAL NET GENERAL EXPENDITURE

\$4 835 700 000

The Government Dollar —
Fiscal Year 1971-72 Interim



Each year the provincial government prepares its budget, deciding how to spend the amounts collected by various taxes. The table above shows the distribution of Revenue and Expenditures for the fiscal year 1971-72 for one of the provinces.

① The largest revenue is from individual income taxes.

② The largest expenditure is for education.

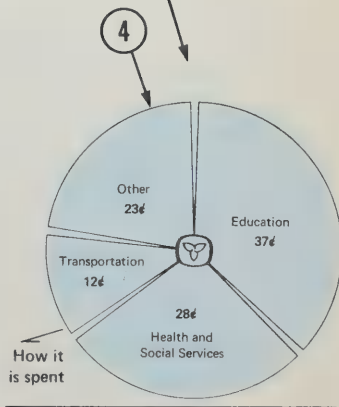
③ Notice that the net general revenue is less than the net general expenditure.

The graphs below have been prepared from the data in the table. Notice that each graph represents one dollar.

④ By what other method could you illustrate the revenue and expenditure graphs?

⑤ Were the revenues for Health and Social Services as great as the amount spent on these programmes?

⑥ Which shows the relationships between revenues and expenditures clearer—the table or the graphs?



9 a / INTERPRETING LINE GRAPHS

Point out that the heading of a graph should show the name, the kind of data, and the period of time, if appropriate.

In Chapter 8, data was presented in tabular form as arrays and frequency distributions. Data can also be presented in visual form using various kinds of graphs. Graphs help us *see* the way the numbers are related to each other. They are often used in business magazines and company reports. Here is a typical graph.

The Regal Restaurant
Sales by Calendar Quarters
July 1, 1973 to December 31, 1975

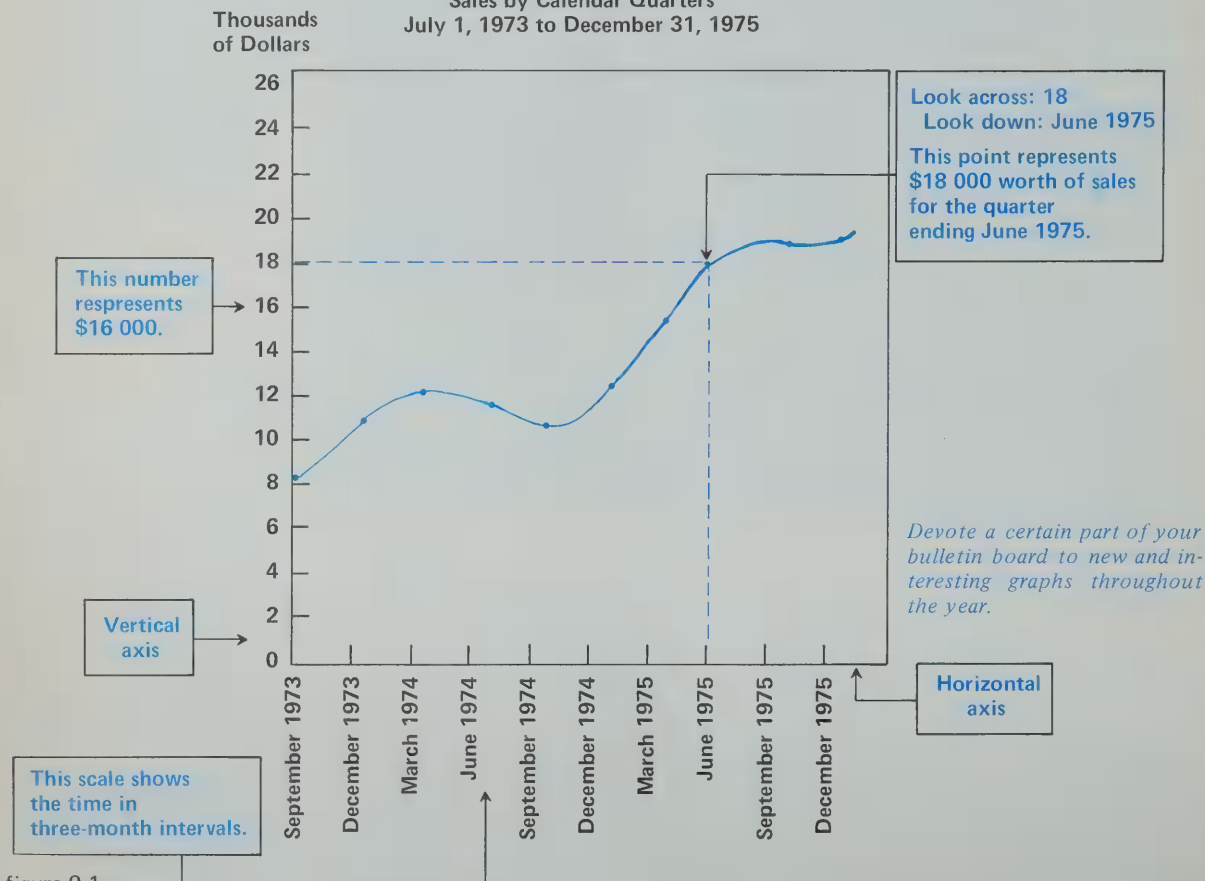


figure 9.1

Project: Look for graphical presentation of statistical data in books, magazines, and newspapers. Does a particular shape of graph recur? What type of data does it represent?

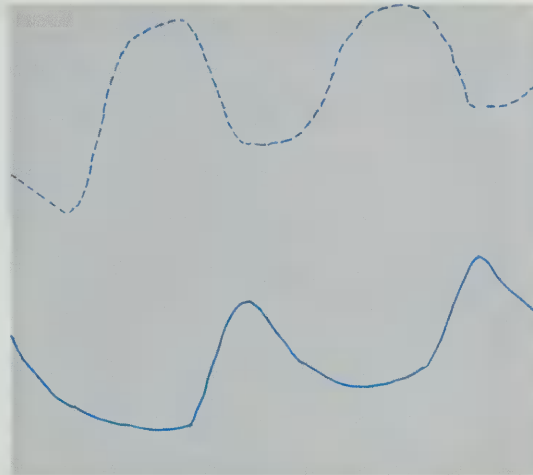
Line graphs are most often used to show how some quantity changes according to *time*. The time can be shown in days, weeks, years, and so on. Time is usually shown on the *horizontal axis*, the line at the lower edge of the graph.

Line graphs can show important relationships that may not be obvious from lists of data.

**Sales by Calendar Quarters
October 1, 1972 to March 31, 1975
Browse Awhile Book Store**

Paperback books
always sold more
copies than hard-
cover books.

Sales are
falling.



Paperback sales drop
from 7900 copies to
6300 copies

*Discussion Question: How
else might the Browse Awhile
Book Store represent its sales
on a graph? How would these
graphs differ from the one
shown?*

Sales are steadily
increasing even
though there are
seasonal dips.

Lowest point:
period ending
September 30, 1973

*Consider: Sales by months
rather than quarters, total
number of sales rather than
separate hardcover and paper-
back sales; sales in dollars
rather than number of books
sold.*

figure 9.2

EXERCISES Use figure 9.2.

- How many months are included in this graph? **27**
- Do hardcover sales seem to be higher at any particular time of the year? **at the end of each year**
- During what months are paperback sales highest? **July-October**
- What is the total number of books sold (hard cover + paperback) for the period ending April 1, 1973? **5500**
- What is the total number of books sold during 1974? (Note that the first period of 1974 ends on April 1, 1974 and the last period ends on January 1, 1975.) **≈ 37 000**
- What is the total amount in dollars for hard cover books for the period ending January 1, 1974? **\$14 000**
- What is the total amount in dollars for both hardcover and paperback books for the period ending January 1, 1974? **\$19 500**
- What is the total amount in dollars for all books sold during 1974? **\$71 300**
- The lowest period for total sales each year is the period ending April 1. Compare the total amount in dollars for all books sold for the three periods ending April 1.
1973: \$10 400 1974: \$15 500 1975: \$19 100

Suppose the average price of a hardcover book

9 b / CONSTRUCTING GRAPHS

Point out that a graph is an easy way to present a large amount of data in a compact manner.

We use a line graph to show visually a relationship between data. The easiest way to make a line graph is to use graph paper. Select a vertical line near the left and a horizontal line near the bottom and assign a scale of values to each axis. The values you assign depend on your data, but in a time series, time should be on the horizontal axis.

EXAMPLE

Prepare a line graph for the per capita income in dollars from 1960 to 1970:

	1960	\$2217
	1961	\$2267
These dates will be on the horizontal scale.	1962	\$2366
	1963	\$2448
	1964	\$2566
	1965	\$2746
	1966	\$2940
	1967	\$3149
	1968	\$3330
	1969	\$3417
	1970	\$3572

These values range from about \$2000 to about \$3600.

The line graph is shown in figure 9.3.

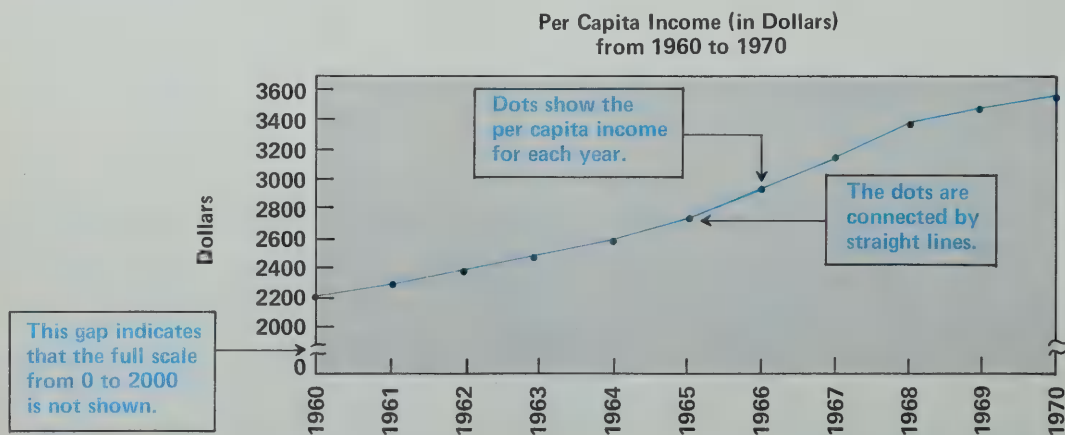


figure 9.3

Discussion Question: Where and how are graphs used? Consider: Business, education, government, and research.

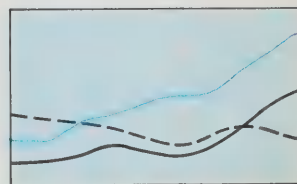
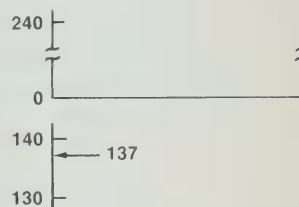
Since the graph above is a time series, we use the horizontal scale for the years and the vertical scale for the incomes. Look at the dot above 1966. It seems to be just below \$3000. Even though we cannot read the *exact* value for 1966 from this graph, we can tell that the per capita income was greater in 1966 than in 1965. Also, it was greater in 1967 than in 1966.

There are several things to remember when drawing graphs.

- (1) Choose a scale according to the range of the data to be presented.
- (2) On each scale, a specific distance must *always* represent the same value. If 1 centimetre represents 200 metres in one place, it must *always* represent 200 metres.
- (3) If there is a wide gap on the scale, break the axis to indicate that the full scale is not shown.
- (4) If a value falls between two lines on the scale, estimate its location as accurately as possible by pro-rating.
- (5) Each graph should have a title to indicate the data presented. The source of the data should be shown as a footnote.
- (6) If more than one curve is plotted on one grid, use a solid line for one curve and a dashed or dotted line for the other, or use different colours.

Note that the data in these problems forces the students to round the number when making the graphs.

If the students follow these hints, they should be able to make graphs that are clear and concise.



EXERCISES Prepare line graphs for these data. *Answers are in back of book.*

1. The population of Canada from 1881 to 1971. 3. Total Federal Government Expenditures for

Source: *Quick Canadian Facts.*

1881	4 324 810	1931	10 376 786
1891	4 833 239	1941	11 506 655
1901	5 371 315	1951	14 009 428
1911	7 206 643	1961	18 238 247
1921	8 787 949	1971	21 568 300

selected years (millions). Source: *Information Canada.*

1944	5320
1947	2089
1950	2370
1958	6176
1962	7486
1966	9761
1968	12 190
1969	13 537
1970	15 296

2. Sales by months for the year 1972 by Jantzens' Discount Store in Winnipeg.

January	\$32 318.27
February	\$26 832.40
March	\$28 172.89
April	\$35 567.12
May	\$38 295.19
June	\$42 345.02
July	\$45 259.52
August	\$41 783.25
September	\$43 835.63
October	\$40 124.07
November	\$48 543.26
December	\$65 349.33

4. Expenditures for health care in Canada (in millions of dollars) for selected years (1954 to 1971. Source: *Information Canada.*

1954	260
1959	436
1963	1064
1966	1486
1969	2503
1971	3897

9 C / GEOMETRIC GRAPHS

A *bar graph* is similar to a line graph since it relates sets of data. However, instead of connecting dots to form a line, we draw bars from the axis to the dots. The bars are all the same width and are usually vertical. The widths have no effect on the values. A bar graph is often used when time is not part of the comparison.

This data is presented alphabetically by countries. It could also be graphed from lowest production to highest production or vice versa.

EXAMPLE

Prepare a vertical bar graph for these data showing imports of grape juice concentrate into Canada from selected countries in 1973.

	Quantity (Kilograms)
France	2 448 865
Italy	892 229
Spain	4 722 750
United Kingdom	513 332
United States	1 736 497

Grape Juice Concentrate Imports by Canada
(in Millions of Kilograms)
from Selected Countries in 1973

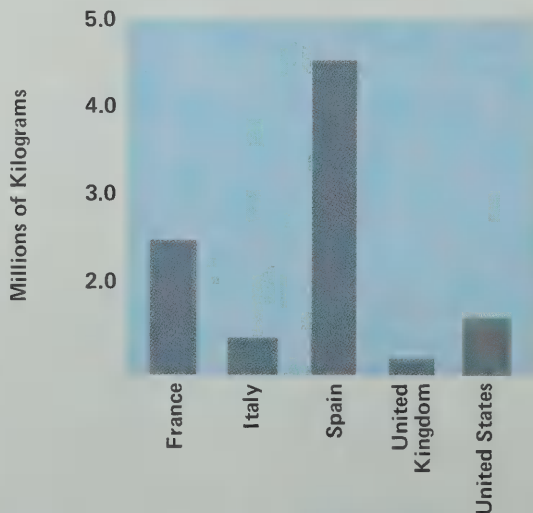
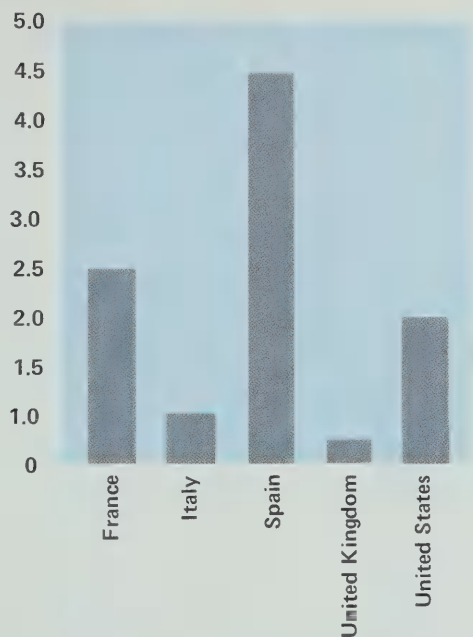


figure 9.4

This technique is sometimes used intentionally to misrepresent data. For instance, a company may use it to show that their product is three times better than another company's.

A graph can sometimes be misleading. In the example above, the length of the bars seems to indicate that concentrate production in France is two times as much as that in Italy. However, if you examine the values shown on the vertical axis you see that is not true. The distortion is caused by the gap in the vertical axis.

The following graph shows the same information, but the vertical axis has no gap in it.



*Some students may be interested in other methods used to misrepresent statistics. A good source book would be *How to Lie with Statistics* by Darrell Huff.*

figure 9.5

EXERCISES Prepare vertical bar graphs for the following data. *Answers are in back of book.*

1. The population of Canada for selected years 1901 to 1971. Source: *Quick Canadian Facts*.

1901	5 371 315
1921	8 787 949
1941	11 506 655
1951	14 009 428
1961	18 238 247
1971	21 568 300

2. Amount of Total Federal Government expenditures for selected years 1950–1971.

1950	2 370 000
1958	6 176 000
1966	9 761 000
1968	12 190 000
1970	15 296 000
1971	17 368 000

3. Expenditures for health care in Canada (in millions of dollars) for selected years 1954 to 1971. Source: *Information Canada*.

1954	260
1959	436
1963	1064
1966	1486
1969	2503
1971	3897

4. Per capita income (in dollars) in Canada for selected years from 1960 to 1970.

1960	\$2217
1962	\$2366
1964	\$2566
1966	\$2940
1968	\$3330
1970	\$3572

9 d / GEOMETRIC GRAPHS

Notice that the heights of the bars show the normal probability curve.

As you recall from Chapter 8, a frequency distribution is a convenient method for finding the mean (average) by grouping the data. The class intervals and frequencies can be shown on a graph made up of rectangles. The scale of the horizontal axis is based on the class intervals, and the vertical scale shows the frequency for each class interval. The graph of a frequency distribution is called a *histogram*. Figure 9.6 is the histogram for the data in the example on page 75 of Chapter 8.

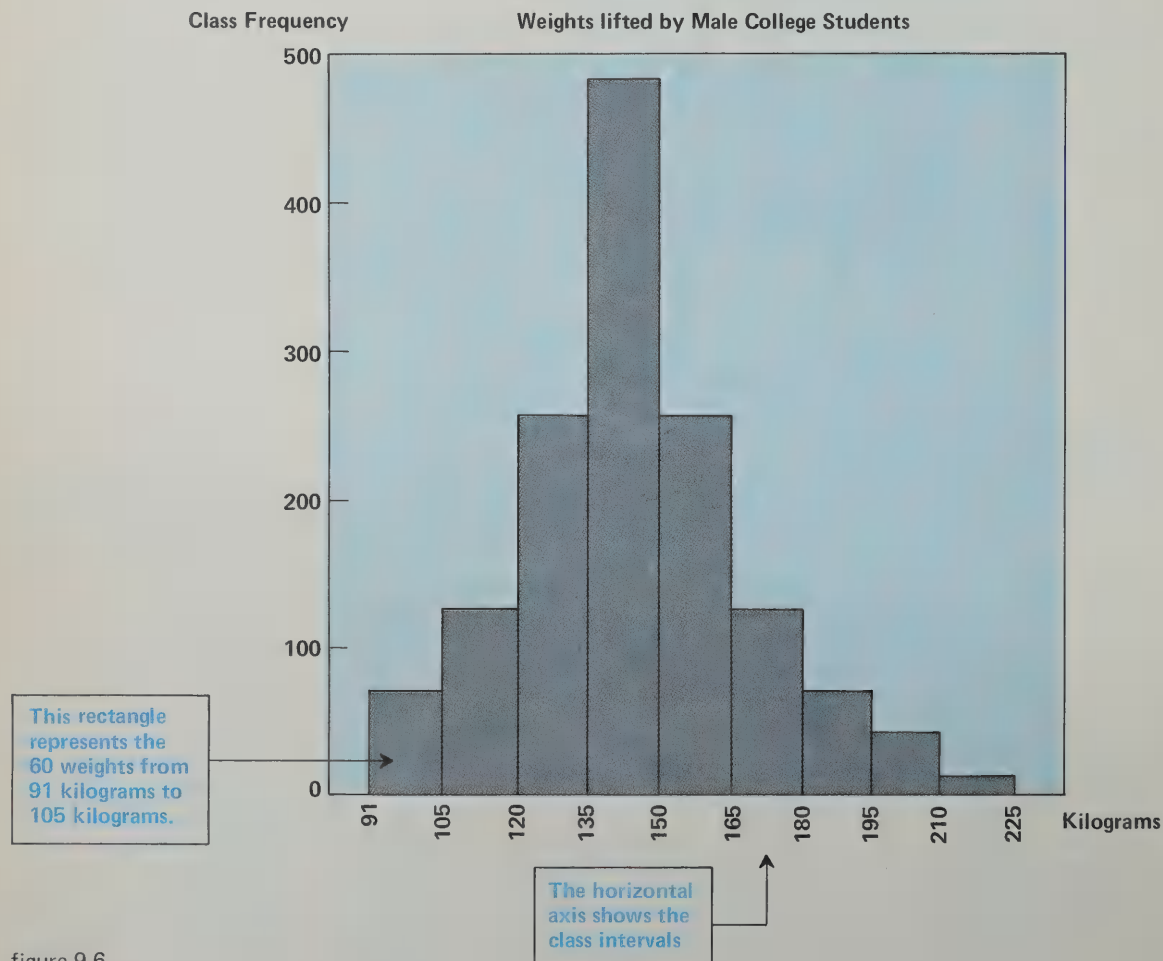


figure 9.6

FACTS AND FIGURES

Oil was first produced in Canada in Southwestern Ontario in the 1850's. By 1895, production reached a high of 800 000 barrels. It was not until after World War II that major discoveries were made. Today Canada ranks 8th in world production and 12th in reserves.

Crude oil production in 1972 totalled 562 309 600 barrels as opposed to 492 739 049 in the previous year. In 1972, Canada imported 281 664 159 barrels of crude oil, while exporting 341 252 881 barrels of crude.

In 1972, about \$900 million was spent in Canada on oil exploration and development.

Facts and Figures

- (1) Compare crude oil production in Canada between 1971 and 1972.
- (2) Prepare a bar graph illustrating this relationship.
- (3) How much more oil was exported than imported in 1972?
- (4) Who was Canada's largest customer for crude oil?

EXERCISES Prepare histograms for these frequency distributions. *Answers are in back of book.*

- 1. Television sets sold at Hodgkins TV and Radio in one month.
- 3. Sales by salesmen for Evan's Furniture Store for one week in May.

CLASS INTERVAL (DOLLARS)	NUMBER OF SETS SOLD
\$201—\$300	9
\$301—\$400	10
\$401—\$500	13
\$501—\$600	8
\$601—\$700	2

CLASS INTERVAL (SALES)	NUMBER OF SALESMEN
\$401—\$450	2
\$451—\$500	3
\$501—\$550	4
\$551—\$600	5
\$601—\$650	1

- 2. Men's suits sold by Brill and Gun in one month.

CLASS INTERVAL (DOLLARS)	NUMBER OF SUITS SOLD
\$50.01—\$60.00	14
\$60.01—\$70.00	15
\$70.01—\$80.00	17
\$80.01—\$90.00	13
\$90.01—\$100.00	8
\$100.01—\$110.00	6
\$110.01—\$120.00	3

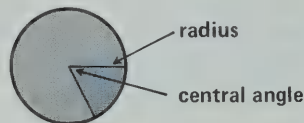
- 4. Sales by salesmen for the London Garden Supply (1973) Ltd. for the month of March.

CLASS INTERVAL (SALES)	NUMBER OF SALESMEN
\$1501—\$1600	1
\$1601—\$1700	2
\$1701—\$1800	3
\$1801—\$1900	6
\$1901—\$2000	4
\$2001—\$2100	2
\$2101—\$2200	1

When data are given in percentages, a circular graph called a *pie chart* can be used to illustrate them. The area of the whole circle is considered as 100%. If 40% is to be shown, then 40% of the area of the circle is used. We can find 40% of the area of a circle by using central angles.



A central angle has its vertex at the centre of the circle.



If we want the area of the pie-shaped piece to be 40% of the area of the circle, the central angle must measure 40% of 360° .

$$0.40 \times 360^\circ = 144^\circ$$

The central angle must measure 144° . Similarly, if 20% is to be shown, we use a central angle of $0.20 \times 360^\circ$ or 72° .

We can distinguish areas by shading, dotting, crossing lines to form squares or triangles, and so on. Of course, one area may also be left unmarked.

EXAMPLE

Prepare a pie chart showing the percent of sales by department for Bouchard's Food Market for the month of November.

DEPARTMENT	PERCENT
Grocery	39%
Produce	24%
Meat	21%
Bakery	5%
Sundries	11%
	<u>100%</u>

Multiply each percent by 360° . (Round the degree to the nearest whole number.)

Grocery:	$0.39 \times 360^\circ = 140.0^\circ$
Produce:	$0.24 \times 360^\circ = 86.4^\circ$
Meat:	$0.21 \times 360^\circ = 75.6^\circ$
Bakery:	$0.05 \times 360^\circ = 18.0^\circ$
Sundries:	$0.11 \times 360^\circ = 39.6^\circ$
	<u>360.0°</u>

Figure 9.7 shows the pie chart for this data.

Project: Toss a pair of dice 100 times, keeping track of the number of times each total from 2 to 12 turns up. Graph the result. What is the most frequent number? What would you guess the graph would look like if you tossed the dice 500 times? 1000 times? 11 000 000 times?

This type of chart usually appears in newspapers every year at tax time. Two circles are often shown—one representing income, the other expenditures. As long as the circles are the same size, the data can be compared. If one circle is larger, the area of each sector varies directly with the square of the radius. In this instance, only percentages should be compared, not areas.

Key:

Grocery

Produce

Meat

Bakery

Sundries

Sales of Bouchard's Food Market
by Departments for November

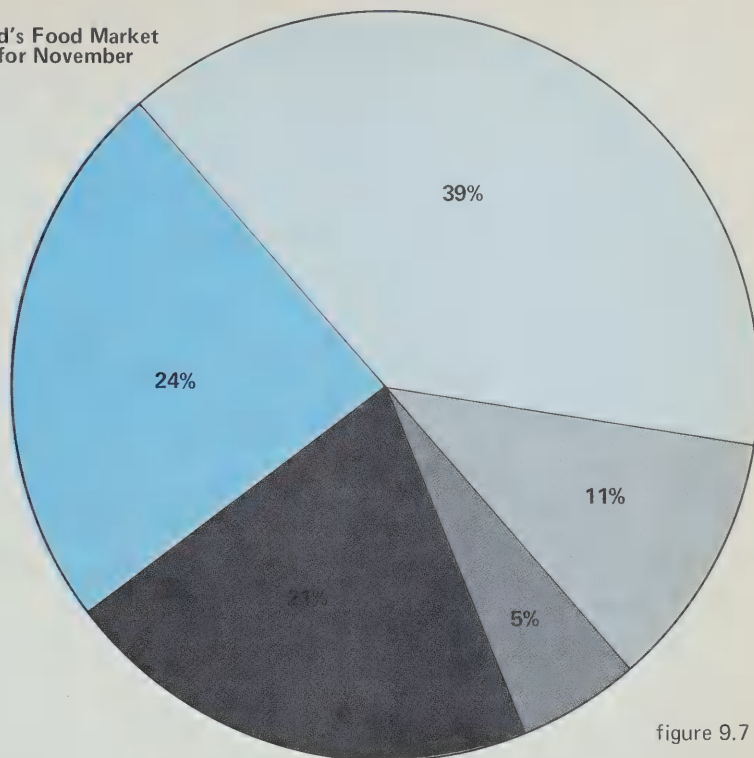


figure 9.7

EXERCISES Prepare pie charts for these data. *Answers are in back of book.*

1. Consumption of ice cream by flavours in Dartmouth, Nova Scotia.

FLAVOUR	PERCENT
Vanilla	53%
Chocolate	18%
Strawberry	9%
All others	20%

3. Educational degrees of high school teachers in British Columbia.

DEGREE	PERCENT
Doctorate	5%
Masters	27%
Bachelors	68%

2. The cost of owning and operating an automobile per dollar in Manitoba.

EXPENSE	AMOUNT
Depreciation	28¢
Repairs and tires	23¢
Gasoline and oil	20¢
Insurance	16¢
Taxes and license	8¢
Other	5¢

4. Employees of Alberta by age groups.

AGE GROUP	PERCENT
18-29	17%
30-39	29%
40-49	27%
50-59	16%
60-70	11%

REVIEW / GRAPHS

CHECKLIST

Axis (p. 84)
 Bar graph (p. 88)
 Central angle (p. 92)
 Graph (p. 84)
 Graph paper (p. 86)
 Histogram (p. 90)
 Horizontal scale (p. 84)
 Line graph (p. 84)
 Pie chart (p. 92)
 Vertical bar graph (p. 88)
 Vertical scale (p. 84)

PROBLEMS Answers are in back of book.

In problems 1 through 6, prepare line graphs to show the data.

1. Earning per share of common stock of Wills Motors Ltd. Source: Annual reports.

1961	\$1.52	1966	\$2.23
1962	\$1.64	1967	\$2.49
1963	\$1.70	1968	\$2.55
1964	\$1.87	1969	\$2.58
1965	\$2.08	1970	\$2.47

2. Number of common stockholders of the Borg-Warner Corporation. Source: Annual reports.

1961	61 300	1966	69 900
1962	63 400	1967	67 900
1963	63 600	1968	66 700
1964	63 200	1969	65 700
1965	65 300	1970	67 000

3. Number of customers of the Alberta Gas Company. Source: Annual reports.

1961	115 778	1966	122 446
1962	117 068	1967	124 340
1963	118 175	1968	126 615
1964	119 520	1969	129 457
1965	121 319	1970	134 822

4. Number of common stockholders of the Alberta Gas Company. Source: Annual reports.

1961	11 686	1966	12 385
1962	12 006	1967	14 100
1963	11 709	1968	15 800
1964	11 451	1969	16 655
1965	12 376	1970	16 728

5. Hourly employment costs of the Griffin Steel Corporation. Source: Annual reports.

1961	\$4.57	1966	\$5.01
1962	\$4.62	1967	\$5.19
1963	\$4.68	1968	\$5.57
1964	\$4.74	1969	\$5.72
1965	\$4.81	1970	\$6.11

6. Number of employees of the Griffin Steel Corporation. Source: Annual reports.

1961	199 243	1966	205 544
1962	194 044	1967	197 643
1963	187 721	1968	201 017
1964	199 979	1969	204 723
1965	208 838	1970	200 734

In problems 7 through 12, prepare vertical bar graphs.

- Use the data in problem 1.
- Use the data in problem 2.
- Use the data in problem 3.
- Use the data in problem 4.
- Use the data in problem 5.
- Use the data in problem 6.

In problems 13 through 16, prepare histograms for the frequency distributions.

13. Monthly salaries of the employees of the Gravy Company.

CLASS INTERVALS

(DOLLARS)	FREQUENCY
\$351—\$450	15
\$451—\$550	18
\$551—\$650	23
\$651—\$750	34
\$751—\$850	29
\$851—\$950	21

14. Contributions to the United Way annual drive made by employees of the Delicious Food Products Company.

CONTRIBUTION

(DOLLARS)	FREQUENCY
\$6—\$10	53
\$11—\$15	46
\$16—\$20	38
\$21—\$25	26
\$26—\$30	22
\$31—\$35	30
\$36—\$40	28
\$41—\$45	21
\$46—\$50	15

15. Golf scores posted for the annual 18-hole medal play championship tournament of the Addison-Wesley Publishing Company.

SCORES	FREQUENCY
71—80	5
81—90	7
91—100	8
101—110	11
111—120	15
121—130	6
131—140	1

16. Amount of life insurance carried by the employees of the Brian Green Company.

AMOUNT (THOUSANDS

OF DOLLARS)	FREQUENCY
1—10	35
11—20	56
21—30	23
31—40	17
41—50	12
51—60	9
61—70	6
71—80	4
81—90	0
91—100	2

In problems 17 through 20, prepare pie charts to show the percentages.

17. Marital status of employees of the Norton Company Ltd.

STATUS	PERCENT
Married	62%
Single	18%
Divorced or separated	12%
Widows and widowers	8%

18. Religious preferences of employees of the Rainbow Bubble Bath Company.

DENOMINATION	PERCENT
Protestant	61%
Catholic	19%
Jewish	8%
Others or no preference	12%

19. Disposition of the sales dollar of the Plastic Paper Products Company.

DISPOSITION	PERCENT
Cost of goods sold	60%
Administrative expenses	19%
Selling expenses	14%
Taxes	4%
Net profits	3%

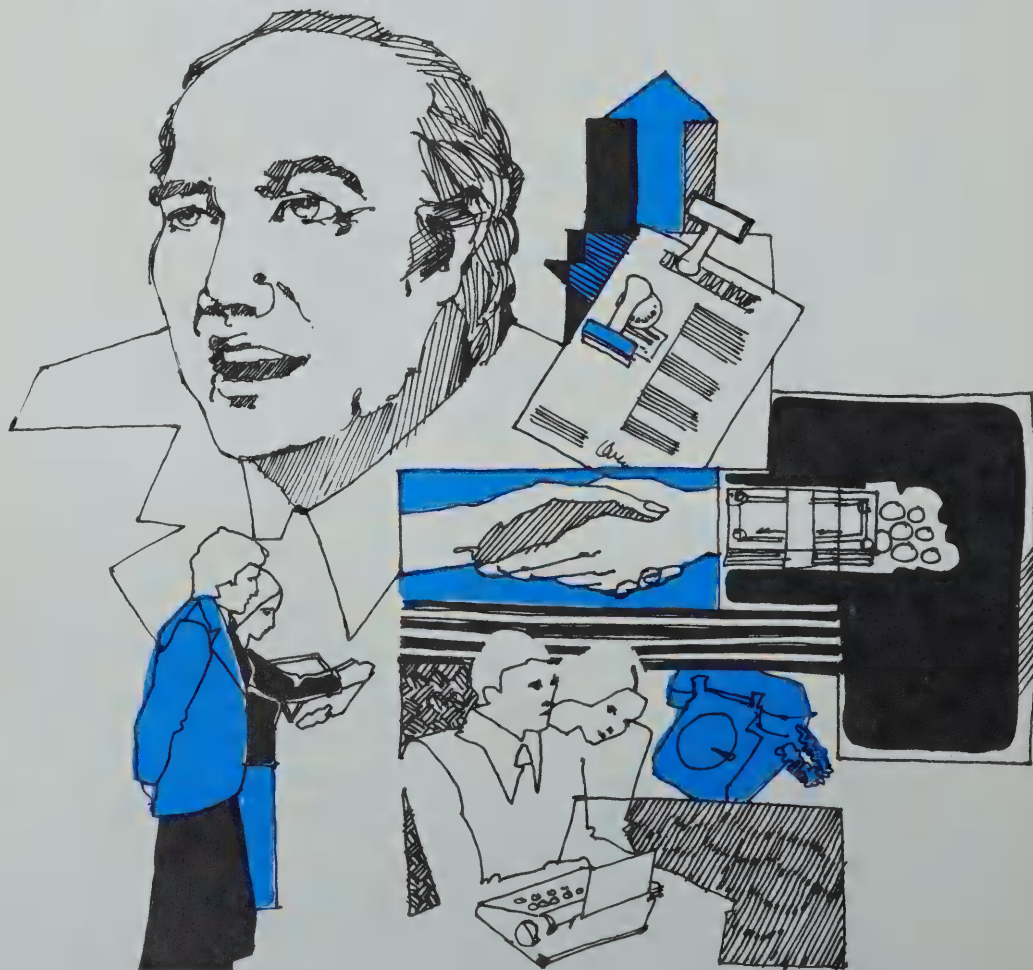
QUESTIONS

- How is graph paper used?
- Where are the horizontal and vertical axes on a graph?
- What advantages does graphic presentation of statistical data have over tabular presentation?
- What is a bar graph?
- How do you graph a frequency distribution?
- What is a histogram?
- What is a pie chart?
- If the pie-shaped area enclosed by a central angle is $2\frac{1}{2}\%$ of the area of the circle, how large is the central angle?
- If you have a list of data, how can you tell whether to use a line graph, a histogram, a bar graph, or a pie chart?

Talent, Imagination, And A Business Of Your Own

Jim and Peggy had both completed high school with first-class honours. Jim continued on to university where he obtained a Bachelor of Commerce degree in Accounting. Peggy enrolled in a Business course at the community college and obtained a certificate in Marketing Management.

One day Peggy and Jim met in a shopping plaza and decided to have a coffee in a local restaurant where they discussed the possibility of starting a business of their very own.



"We should put our talents to work for us," Peggy said.

"It's not very easy to find a full-time job these days," replied Jim. "If we were to explore several business opportunities we could perhaps find the right one."

Peggy suggested that a "part-time help service" would be an excellent business, since she had noticed that there was always a need for part-time employees in the community. She had also learned that employers were faced with the difficulty of finding part-time help.

"People could phone or come to our office and we would be able to provide them with persons to fill their needs," replied Jim. "I would spend the time searching for the part-time help and informing the local businesses of our unique service. Let's do it."

"My father is not very enthusiastic," replied Peggy. "He thinks there are too many problems that we can't solve in starting a business. He suggested that we stop by and visit his friend, Mr. Senchuk, who is a prosperous businessman and President of the local Chamber of Commerce."

Mr. Senchuk, listened to their story, nodding his agreement as he heard their plans.

"We don't have much money. We are convinced this town could use a service like ours," Peggy concluded.

"Every business has to start sometime," Mr. Senchuk replied. "Many people who own and operate successful businesses got started on a shoestring, to use a figure of speech. They had an idea, a little money in a savings account, the will to work hard, and the courage to take a risk."

"They may have had a little luck, too," commented Jim.

"To start with you'll need working capital to pay the bills. By that I mean the money to pay your monthly operating expenses such as office rent, salaries of your part-time employees, taxes, insurance, advertising, utilities, repairs, and maintenance."

Jim and Peggy looked dismayed at this statement. "I think we had better work from my home at first," replied Jim.

"If you are successful, you will be able to pay the operating expenses out of the income from your serv-

ice. Your net profit will be any income left over after expenses are paid. Of course, if you don't have enough income to cover expenses, you will have a net loss."

"You will also need money to purchase some equipment. You will need a desk, chairs, typewriter, lamps, paper, stamps, and whatever else is necessary for your business. Since you will be working at home, you won't need all these things right away."

"Where does all this money come from?"

"You will need to use some of your savings to launch your business career. If that's not enough to get started, then the venture capital—as we call it—must be increased from other sources. If you were starting a large business, then we could bring other people with investment funds into the business as partners or members of the corporation. In your case, though, if you don't have enough investment money of your own, you will have to arrange to borrow funds. You can obtain a loan from a bank if you have money of your own to risk and your plans appear sound to the bank."

"It is usually recommended that you immediately employ an accountant to set up your books and establish accounting procedures. Since Jim has studied accounting at university he will have little difficulty in setting up an accounting system for your business."

"One of the leading causes of small business failures is the lack of adequate accounting records. You must know what your net profit or loss is in order to make management decisions for survival."

While Jim and Peggy contemplated the possibility of failure, Mr. Senchuk concluded his remarks. "Lack of experience and know-how to operate a particular kind of business can also result in failure. Operating a restaurant requires different skills than running a pet shop. I'm glad to see you're using skills you have been trained in."

"Thank you for your advice, Mr. Senchuk," said Jim and Peggy. "And remember just call us any time you need for part-time help."

"I will," promised Mr. Senchuk, "I'll be your first customer."

Research/Discuss

The last three questions are designed to let students share with each other their understanding

CHAPTER 10

of how a small retail business operates. They should be able to look at retailing from many points of view.

- ☐ *Consider these questions in your discussion: Does the money spent in advertising bring sales? Must these sales pay for the advertising?*
- ☐ *Elicit students' reactions to different types of advertisements.*
- ☐ *Risks on capital: pays all expenses first including time and knowhow.*
- ☐ *Large quantities mean quantity discounts.*
- ☐ *He will mark it down to cost or below. If it still won't sell, he will probably give it to his employees or to charities.*

SALES, CASH, AND TRADE DISCOUNTS

RESEARCH/DISCUSS

- ☐ Why do businessmen advertise?
- ☐ What type of advertising attracts a potential consumer to a store?
- ☐ Why should a businessman make a profit?
- ☐ What are the advantages of volume buying?
- ☐ What happens to the merchandise that a businessman is unable to sell?

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ about sales discounts to retail customers
- ☐ how you can determine cash and sales discounts
- ☐ the meaning of trade discounts
- ☐ the meaning of chain discounts and how to determine rapidly what they are in each case.

10 a / SALES DISCOUNTS (MARKDOWNS)

Some retailers attempt to attract consumers by the use of *sales discounts* or price *markdowns*. Sales discounts are usually used in cases where the particular goods cannot be sold at the regular price. Goods that may have superficial defects are at times sold at sales discount. Sales discounts are also offered if the customer purchases two or more of an item.

It is possible to obtain sales discounts as a percent (fractional) reduction or as a dollar reduction. The most common is percent reduction. Most merchandise is marked up 50% or less. The retailer, if he wishes to make a profit, must limit his markdowns to less than 50%.

Sales discounts are usually in multiples of 5% such as 25% or 30%. When fractions are used the most common appear to be $\frac{1}{3}$ or $\frac{1}{4}$.

$$\frac{1}{3} = 33\frac{1}{3}\%$$

$$\frac{1}{4} = 25\%$$

Project. Make a survey of retail stores to find out what they do with merchandise that will not sell at the advertised price. Find out how long the merchandise is in the store before price reductions are tried. Find out what they do with merchandise that cannot be sold at any price.

Discussion Question: What is a fair profit for a merchant? Consider: His yearly net profit as compared to a year's pay for a salaried employee; the amount of interest he loses on his invested capital; what happens if some merchandise does not sell.

To be effective, advertisements in newspapers and magazines must first catch the reader's attention. These sales slogans were taken from many ads. Discuss the ways in which they make customers want to buy. Are some ways more effective than others?

Discussion Question: Is it wise to purchase goods which are on sale? Why or why not?

What factors must you take into account to assure yourself of having made a good deal?

Get lowest price ever

from 20% to 50% off

LIMITED OFF FOR 1 WEEK

at special prices!

Regularly 69.00 to 89.00

now 44.00

*BANK CREDIT CARDS WELCOME

25% off reg. prices

While stocks last

THIS WEEK ONLY...

SAVE! SAVE! SAVE!

Easy to buy on credit terms. Take months

3 WAYS TO CHARGE

SAVE \$89.00

Guarantee*

value 369.95

YEAR END DISCOUNTS

one

25% off

Regularly 122.00

now 66.30

COUPON

26.95

3.99 each for \$10

95 with this ad

SPECIALLY PRICED

SAVE \$72

\$298

Nothing down and \$25 a month*

SALE \$55.00 orig. 70.00

290

Project: Find and discuss the ways advertising influences consumers. Make a bulletin board display that answers these questions: What motivates consumers to buy goods? To what does advertising appeal? What effect would "markdowns", "discounts", and "cash discounts" have on motivating consumer purchasers?

EXAMPLE

Find the discount and net price (amount paid for the merchandise) for the television and refrigerator shown here.



Find the amount of the discount.

$$25\% = 0.25$$

$$\$475 \times 0.25 = \$118.75$$

- The discount on the television is \$118.75.

$$\frac{1}{4} = 0.25$$

$$\$695 \times 0.25 = \$173.75$$

- The discount on the refrigerator is \$173.75.

Subtract to find the net price.

$$\$475.00 - \$118.75 = \$356.25$$

- The net price for the television is \$356.25.

$$\$695.00 - \$173.25 = \$521.25$$

- The net price for the refrigerator is \$521.25.

EXAMPLE

An electric guitar priced regularly at \$295 is offered at \$50 off. Find the net price.

$$\$295 - \$50 = \$245$$

- The net price is \$245.

Ask students what percent this discount is. (16.9%)

EXERCISES Find the discounts and net prices for each of the following.

- \$3.25 less 30% **\$0.98; \$2.27**
- \$6.50 less 40% **\$2.60; \$3.90**
- \$9.85 less $\frac{1}{3}$ **\$3.28; \$6.57**
- \$7.50 less $\frac{1}{4}$ **\$1.88; \$5.62**
- \$12.95 less 25% **\$3.24; \$9.71**
- \$14.25 less 20% **\$2.85; \$11.40**
- \$15.50 less $\frac{1}{2}$ **\$7.75; \$7.75**
- \$19.85 less $\frac{1}{3}$ **\$6.62; \$3.23**
- \$24.98 less 15% **\$3.75; \$21.23**
- \$52.50 less 10% **\$5.25; \$47.25**
- \$75.00 less $\frac{1}{4}$ **\$18.75; \$56.25**
- \$99.50 less $\frac{1}{5}$ **\$49.40; \$79.60**
- \$485.00 less $33\frac{1}{3}\%$ **\$161.67; \$323.33**
- \$645.85 less 15% **\$96.88; \$548.97**
- \$345.98 less 40% **\$138.39; \$207.59**

A *cash discount* is a type of discount offered to a buyer who has an account and pays his bill within a certain time period. The purpose of this discount is to encourage customers to pay their bills promptly. Although cash discounts are usually reserved for wholesalers and retailers, consumers receive similar discounts by paying their utility bills within a specified period of time.

The cash discount amounts to about 2% of the amount due. A time limit is set after which the discount does not apply. The most common time limit is 10 days after invoice date.

Discussion Question: Why is the manufacturer or wholesaler prepared to give up a 2% discount in exchange for the customer's prompt payment?

EXAMPLE

A cash discount of 2% is offered on an invoice of \$56.50. Find the cash discount and the net amount payable.

Find 2% of the invoice amount.

$$\$56.50 \times 0.02 = \$11.39$$

- The cash discount is \$11.39.

Subtract to find the net amount.

$$\$56.50 - \$11.39 = \$558.11$$

- The net amount payable is \$558.11.

Project: Which stores in your area offer cash discounts?

Hampton Linen Company sends this invoice to Lancer's Department Store to request payment for a shipment of towels. ① This number was on the purchase order Lancer's sent to Hampton when they ordered the towels. By referring to this number in their files, Lancer's can easily determine whether or not Hampton has sent the correct merchandise.

② The price is the unit price. That is, one bath towel, #85P 5221F costs \$2.38.

③ The extension gives the price for the quantity ordered: $\$2.38 \times 48 = \114.24 .

④ This shows the terms of the sale: if Lancer's sends payment within 10 days of the date of the invoice (by 24/6/74), they may deduct 2% of the total amount due. If they do not pay within 10 days, the total (net) amount is due in 30 days.

Lancer's Department Store 5714 Jasper Ave Edmonton, Alberta.			
48	85 P 5221F	1	bath towels (8 each colour)
48	85 P 5222F		hand towels (8 each colour)
48	85 P 5223F		wash cloths (8 each colour)
48	85 P 5224F		fingertip towels(8 each colour)
		2	
			10/15/77 3
			\$2.38 \$114.24
			1.29 61.92
			0.67 32.16
			0.76 36.48
			\$244.80
			Delivery charges
			12.24
			\$257.04

EXERCISES Find the cash discounts and the net amounts payable.

INVOICE	DISCOUNT	INVOICE	DISCOUNT	INVOICE	DISCOUNT
1. \$9.35	2% \$0.19; \$9.16	2. \$8.55	1% \$0.09; \$8.46	3. \$14.50	2% \$0.29; \$14.21
4. \$18.75	2% \$0.38; \$18.37	5. \$29.80	3% \$0.89; \$28.91	6. \$49.50	2% \$0.99; \$48.51
7. \$55.85	2 1/2 % \$1.40; \$54.45	8. \$74.25	2 1/2 % \$1.86; \$72.39	9. \$83.27	1 1/2 % \$1.25; \$82.02
10. \$99.75	1 1/2 % \$1.50; \$98.25	11. \$245.50	2% \$4.91; \$240.59	12. \$775.25	2% \$15.50; \$759.75

10 C / TRADE DISCOUNTS

Compare the way a trade discount is used by wholesalers with the way a retailer uses a discount sale.

Trade discounts are deductions from the retail selling price. It is offered to retailers by wholesalers so that the retailer can resell the goods at a profit to the consumer. It is not possible to operate a retail establishment profitably without a trade discount. The retailer must make a profit in order to pay the operating expenses incurred in the operation of his business.

At times the retail selling price is referred to as the *list* or *catalogue price*. The trade discount is expressed as a percent of the list price. The retailer pays the *net price* for the merchandise.

EXAMPLE

Find the trade discount and the net price for a stereo unit that lists for \$239.50 with a 30% trade discount.

Find the amount of the trade discount.

$$30\% = 0.30 = 0.3$$

$$\$239.50 \times 0.3 = \$71.85$$

- The trade discount is \$71.85.

Subtract to find the net price.

$$\$239.50 - \$71.85 = \$167.65$$

- The net price is \$167.65.

Hardware Supply Company, Inc.
36 Dewdney Ave.,
Regina, Sask.

No. 2198

Date 26/8 1976

Name NORTHARROW HARDWARE STORE Ship to SAME

Address 74 MAIN ST., COURTNEY, B.C. Address 4 2

YOUR ORDER NO. <u>C 93648</u>		SHIP VIA	PAYMENT <u>PREPAID</u> COLLECT	DATE SHIPPED <u>26/8/76</u>	NO. OF PIECES <u>7</u>	WEIGHT <u>126.8 kg</u>
QUANTITY	NUMBER	DESCRIPTION	CASH DISC.	UNIT PRICE	PER TO DISC.	EXTENSION
8 pkgs.	9881525		2%	1.66	pkgs 30%	9.30
24 pkgs.	989121		2%	0.86	pkgs 35%	13.42
60	989862		2%	0.43	EA. 30%	18.06
70 pkgs.	988438	8 SHALLOW WALLSCREW ANCHORS	2%	0.27	pkgs 35%	12.27
15 pkgs.	986172	CASTER DOLLY	2%	4.88	pkgs 30%	51.24
24	988143	3-METRE EXTENSION RULE	2%	2.61	EA. 30%	43.85
BACK ORDER TO			BACK ORDER FROM			
TERMS <u>10th NET 11th</u>			SALES TAX <u>9</u>			
1* SERVICE CHARGE PER MONTH WILL BE ADDED TO ALL 60 DAY PAST DUE BALANCES						TOTAL <u>148.16</u>

③ ⑧ ⑨

Compare this invoice with the one on page 101. Although they are different, the basic information is the same.

① The trade discount is not the same for all items. This may be due to the quantity ordered or the type of item. What would the total amount of the invoice be if the trade discount were not given?

② The extension reflects the trade discount but not the cash discount. The Northarrow Hardware Store must compute the cash discount.

③ The cash discount of 2% applies if the total is paid within 10 days (by September 5, 1976). On the eleventh day (September 6, 1976), the net amount must be paid.

④ Freight charges depend on the weight of the order.

⑤ Sales tax is not charged because the items are for resale.

⑥ The units shown are either single units or packages. What other units might be used?

FACTS AND FIGURES

Annual tourist traffic through Canadian ports of entry totals over 70 million persons, about one half being returning Canadians. About 95 percent of all persons entering Canada, travel by private automobile; of the remaining 5 percent that travel by common carrier—rail, bus, boat, and plane — about 50 percent arrive by aircraft. Entries at the Toronto International Airport exceed 900 000 and at Dorval Airport in Quebec exceed 750 000.

Canadians make about 500 000 visits overseas a year; overseas visitors to Canada number slightly more than that figure. Visits between Canadians and Americans number about 35 000 000 a year in each direction.

Facts and Figures

- (1) Why do Canadians travel outside Canada?
- (2) What effect does the tourist trade have on businesses in Canada?

EXAMPLE

Find the trade discount and net price for an automobile that lists at \$2695 with a 20% trade discount.

Find the amount of the discount.

$$20\% = 0.20 = 0.2$$

$$\$2695 \times 0.2 = \$539$$

- The trade discount is \$539.

Subtract to find the net price.

$$\$2695 - \$539 = \$2156$$

- The net price is \$2156.

EXERCISES Find the trade discounts and the net prices.

LIST PRICE	TRADE DISCOUNT	LIST PRICE	TRADE DISCOUNT
1. \$3.95	40% \$1.58; \$2.37	2. \$4.50	30% \$1.35; \$3.15
3. \$8.75	35% \$3.06; \$5.69	4. \$9.25	40% \$3.70; \$5.55
5. \$10.95	30% \$3.29; \$7.66	6. \$14.45	25% \$3.61; \$10.84
7. \$19.35	32% \$6.19; \$13.16	8. \$49.85	38% \$18.94; \$30.91
9. \$64.40	40% \$25.76; \$38.64	10. \$72.25	42% \$30.35; \$41.90
11. \$155.95	45% \$70.18; \$85.77	12. \$354.50	50% \$177.25; \$177.25
13. \$469.00	33 $\frac{1}{3}$ % \$156.33; \$312.67	14. \$568.00	37 $\frac{1}{2}$ % \$213; \$355
15. \$635.50	42 $\frac{1}{2}$ % \$270.09; \$365.41	16. \$895.25	27 $\frac{1}{2}$ % \$246.19; \$649.06

Trade discounts vary with the quantity purchased. When a buyer purchases a large quantity, his bargaining position is strengthened. Instead of having a single trade discount that varies for different classes of buyers, most wholesalers use a series of discounts called *chain discounts*. This series of discounts increases the discount for customers who purchase larger quantities.

If a transistor radio lists at \$17.95 and the normal trade discount is 40%, the net price would be \$10.77. If the retailer purchases 24 radios, he will receive an additional 10% discount. The quoted price would then be \$17.95 less 40% less 10%. If the buyer takes 12 dozen radios, an additional 10% discount would be given and the quoted price would then be \$17.95 less 40% less 10% less 10%. Notice that only the first discount of 40% is computed on the list price. The further discounts are computed on the net price *after* the previous discount has been taken.

Project: Visit a wholesaler or a jobber and find out if they use chain discounts in quoting prices to their customers. Find out what effect quantity buying has on the trade discounts offered.



- A discount of 40% less 10% is *not* a 50% discount.
- A discount of 40% less 10% less 10% is *not* a 60% discount.

EXAMPLE

Determine the chain discount for a stereo album that lists for \$5.99 less 30% less 20% when 24 albums are purchased.

Find the net price taken after the 30% discount.

$$30\% = 0.30 = 0.3$$

$$\$5.99 \times 0.3 = \$1.80$$

The 30% discount is \$1.80.

$$\$5.99 - \$1.80 = \$4.19$$

The net price for less than 24 is \$4.19.

Find the net price after taking the quantity discount.

$$20\% = 0.20 = 0.2$$

$$\$4.19 \times 0.2 = \$0.838 \text{ or } \$0.84$$

The 20% discount is \$0.84.

$$\$4.19 - \$0.84 = \$3.35$$

- The net price for 24 record albums is \$3.35.
- The chain discount is $\$1.80 + \$0.84 = \$2.64$.

The first discount is computed on the list price; the second discount is computed on the net price *after* the first discount has been taken.



EXAMPLE

Find the chain discount and net cost of a power drill that lists for \$35.00 less 40% less 10% less 5% when bought in lots of three dozen or more.

Find the net price after taking the 40% discount.

$$40\% = 0.40 = 0.4$$

$$\$35.00 \times 0.4 = \$14.00$$

The 40% discount is \$14.00.

$$\$35.00 - \$14.00 = \$21.00$$

The net price after the 40% discount is \$21.00.

Find the net price after taking the first quantity discount.

$$10\% = 0.10 = 0.1$$

$$\$21.00 \times 0.1 = \$2.10$$

The 10% discount is \$2.10.

$$\$21.00 - \$2.10 = \$18.90$$

The net price after the 40% less 10% discount is \$18.90.

Find the net price after taking the second quantity discount.

$$5\% = 0.05$$

$$\$18.90 \times 0.05 = \$0.945 \text{ or } \$0.95$$

The 5% discount is \$0.95.

$$\$18.90 - \$0.95 = \$17.95$$

- The net price for three dozen or more is \$17.95.
- The chain discount is \$14.00 + \$2.10 + \$0.95 = \$17.05.

EXERCISES Find the chain discount and net cost for each of these purchases.

LIST PRICE	CHAIN DISCOUNT	LIST PRICE	CHAIN DISCOUNT
1. \$3.95	40% less 10% \$182; \$2.13	2. \$4.35	40% less 5% \$1.87; \$2.48
3. \$6.75	45% less 10% \$3.41; \$3.34	4. \$8.50	42% less 3% \$3.72; \$4.78
5. \$12.40	35% less 10% \$5.15; \$7.25	6. \$16.60	30% less 15% \$6.72; \$9.88
7. \$25.75	40% less 7% \$11.38; \$14.37	8. \$40.00	38% less 8% \$17.18; \$22.82
9. \$54.10	40% less 10% less 3% \$25.77; \$28.33	10. \$71.35	35% less 10% less 5% \$31.70; \$39.65
11. \$86.90	42% less 5% less 2% \$39.98; \$46.92	12. \$99.40	45% less 6% less 3% \$49.55; \$49.85
13. \$234.20	40% less 10% less 5% \$114.05; \$120.15	14. \$366.50	40% less 5% less 2% \$161.78; \$204.72
15. \$531.25	45% less 10% less 5% \$281.43; \$249.82	16. \$742.10	33 $\frac{1}{3}$ % less 10% less 5% \$319.10; \$423.00

When the same chain discount is used frequently, it is more convenient to compute the price in one step. A single discount that is equivalent to the chain discount can be found. We use complements to find this single discount equivalent.

The *complement* of a number is the difference between that number and 1.00. Similarly, the complement of a percent is the difference between that percent and 100%. For example, if a discount is 40%, then the complement is 60% because $100\% - 40\% = 60\%$. The net cost is also 60%, the same as the complement of the discount.



Project: Find a form like the one shown here and fill it in for various orders.

- Find the complement of each discount in the series or chain.
- Find the product of all the complements of the discounts.
- Find the complement of this product.
- This single discount is equivalent to the chain discount.

Universal Systems, Inc.
 36 Westbrook Road
 Winnipeg, Manitoba

No. A 50955

SOLD TO **Halperns Stereo Equipment**
236 Jackson Blvd
Keswick, Ont.

SHIP VIA **Railway Express**
 SAME

PURCHASE ORDER NUMBER X 3842		F.O.B. PLANT ☒ DESTINATION ☐		PREPAID ☐ COLLECT ☒	SHIP VIA Railway Express	INVOICE DATE 21/4/75
JOB NUMBER		TERMS 3% 10 days, net 30 days		SPECIAL INSTRUCTIONS		
QUANTITY	DESCRIPTION				UNIT PRICE	TOTAL
BACK ORDERED SHIPPED						
32	Stereo Phonograph				\$94.50	\$3024.00
	Less Discount 40% less 10% Amount Due:					1391.04 \$1632.96

Universal Systems, Inc. has prepared this invoice to send to Halperns Stereo Equipment.

- ① Universal offers a 3%, 10-day cash discount.
- ② The total is found by multiplying the unit price by the quantity shipped.
- ③ Universal gives a chain discount of 40% less 10%. This is equivalent to a single discount of 46%.

EXAMPLE

Find the single discount equivalent to a chain discount of 40% less 10%.

Find the complement of each discount.

$$100\% - 40\% = 60\% = 0.60 = 0.6$$

$$100\% - 10\% = 90\% = 0.90 = 0.9$$

Find the product of the complements.

$$0.6 \times 0.9 = 0.54$$

Find the complement of the product.

$$1.00 - 0.54 = 0.46 = 46\%$$

- A single discount of 46% is equal to the chain discount of 40% less 10%.

If the discount consists of a chain of only two discounts, we can find the single discount equivalent by an alternate method. Just subtract the product of the discounts from the sum of the discounts.

EXAMPLE

Find the single discount equivalent to a chain discount of 40% less 10%.

Find the product of the discounts.

$$40\% = 0.40 = 0.4; 10\% = 0.10 = 0.1$$

$$0.4 \times 0.1 = 0.04$$

Find the sum of the discounts.

$$0.4 + 0.1 = 0.5$$

Subtract the product from the sum.

$$0.50 - 0.04 = 0.46 = 46\%$$

- A single discount of 46% is equivalent to the chain discount 40% less 10%.

A discount of 40% means that the price paid after the discount is taken is 60% of the list price. A second discount of 10% means that the price paid after the second discount is taken is 90% of the price paid after the first discount. So, if x = list price,

$$0.6 \times x = \text{price paid after 40\% discount}$$

and

$$0.9 \times (0.6 \times x) = \text{price paid after second 10\% discount}$$

Therefore,

$$0.54 \times x = \text{price paid after both discounts.}$$

This means that the discount is 46%.

EXERCISES Find the single discount equivalent to these chain discounts by the complement method.

- | | | |
|--|--|---|
| 1. 40% less 20% 52% | 2. 40% less 6% 43.6% | 3. 35% less 10% 41.5% |
| 4. 35% less 5% 38.25% | 5. 38% less 9% 43.58% | 6. 37% less 7% 41.41% |
| 7. 45% less 8% 49.4% | 8. 45% less 5% 41.75% | 9. 40% less 15% less 5% 51.55% |
| 10. 40% less 10% less 2% 47.08% | 11. 35% less 10% less 4% 43.84% | 12. 36% less 12% less 5% 46.5% |
| 13. 42% less 5% less 2% 46% | 14. 45% less 11% less 5% 53.5% | 15. $33\frac{1}{3}\%$ less 10% less 5% 43% |

Find the single discounts equivalent to these chain discounts by the alternate method above.

- | | | |
|--|---|---|
| 16. 50% less 5% 52.5% | 17. 50% less 10% 55% | 18. 45% less 7% 48.85% |
| 19. 45% less 6% 48.3% | 20. 42% less 15% 50.7% | 21. 42% less 9% 47.22% |
| 22. 40% less 13% 47.8% | 23. 40% less 14% 48.4% | 24. 37% less 10% 43.3% |
| 25. 38% less 5% 41.1% | 26. 35% less 15% 44.75% | 27. 35% less 12% 42.8% |
| 28. $37\frac{1}{2}\%$ less 10% 43.75% | 29. $37\frac{1}{2}\%$ less 5% 40.63% | 30. $42\frac{1}{2}\%$ less 7% 46.53% |

REVIEW / SALES, CASH, AND TRADE DISCOUNTS

CHECK LIST

- Cash discount (p. 101)
- Catalogue price (p. 102)
- Chain discount (p. 104)
- Complement (p. 106)
- Invoice (p. 101)
- List price (p. 102)
- Markdown (p. 99)
- Net price (p. 100)
- Retail selling price (p. 102)
- Sales discount (p. 99)
- Single discount equivalent (p. 106)
- Trade discount (p. 102)

PROBLEMS

In problems 1 through 6, find the discount and the net price.

1. An ice cream freezer marked \$36.88 is offered for sale at 25% off. **\$9.22; \$27.66**
2. A power lawn mower regularly priced \$174.50 is advertised at $\frac{1}{4}$ off. **\$43.63; \$130.87**
3. Men's shoes regularly priced \$24.50 are on sale at 20% off. **\$4.90; \$19.60**
4. Women's shoes regularly priced \$19.95 are on sale at 20% off. **\$3.99; \$15.96**
5. Family-size cabin tents carrying a \$76 price tag are offered at $33\frac{1}{3}\%$ off. **\$25.33; \$50.67**
6. Dacron insulated sleeping bags priced at \$25.66 are reduced $\frac{1}{3}$. **\$8.55; \$17.11**

In problems 7 through 12, find the cash discounts and the net amounts payable.

7. An invoice dated July 25 for \$63.27 with a 2%, 10 day discount is paid on August 2. **\$1.27; \$62.**
8. An invoice dated October 1 for \$128.39 with a 15-day 2% cash discount is paid on October 12. **\$2.57; \$125.82**
9. A bill for \$48.35 dated March 25 with a 10-day, 3% discount is paid on March 30. **\$1.45; \$46.90**
10. A bill for \$110 dated May 12 with a 3%, 10-day discount is paid on May 23. **no discount; \$110.**
11. An invoice dated November 5 for \$62.10 with a $2\frac{1}{2}\%$, 10-day discount is paid on November 10. **\$1.55; \$60.55**

12. An invoice for \$125 dated August 28 with a $2\frac{1}{2}\%$, 10-day discount is paid on September 3. **\$3.13; \$121.87**

In problems 13 through 18, find the trade discounts and the net prices.

13. Paramount Paint in gallon cans lists at \$7.95. The Peerless Paint Store receives a trade discount of 40% less 10% when they buy a dozen or more cans. Peerless orders one dozen cans of bone white colour. **\$43.88; \$51.52**
 14. The Klassy Klothes Kompany manufactures and sells women's drip-dry dresses. The Queen of Hearts Shop receives a trade discount of 35% less 5% when they order a dozen or more dresses. They order two dozen "moon shot" patterns listed at \$10.95 each. **\$100.52; \$162.28**
 15. Aluminum shaft golf clubs distributed by the Sunshine Sporting Goods Company list at \$149.95 for a set of irons and \$75.00 for a set of woods. The trade discount is $42\frac{1}{2}\%$ with an additional 15%, if a dozen or more sets are ordered. The Birdie Golf Shop orders 4 sets of irons and 4 sets of woods. **\$382.42; \$517.38**
 16. The Tender Crust Pie Company makes and sells pies to restaurants. The wholesale price is \$1.25 for each pie with 10% off if one dozen or more are purchased. The College Coffee Shop orders one dozen pies five days a week. Compute the weekly cost for pies. **\$67.50**
 17. Whipped Cream Toothpaste lists at 75¢ per tube. The Corner Drug Company receives a trade discount of 42% less 12% if they order one gross (144 tubes). They buy a gross. **\$52.88; \$55.12**
 18. Sure Grip automobile chains list at \$14.75 a set. The Local Auto Supply Company receives a trade discount of $42\frac{1}{2}\%$ less 10% if they order a dozen or more sets. They order two dozen sets. **\$170.81; \$183.19**
- In problems 19 through 25, find the single discounts equivalent to the chain discounts using the complement method.
19. The Metropolitan Market receives a 20% less 5% discount on all canned goods purchased from the Dunlop Packing Company. **24%**

20. The Super Market Drug Company receives a discount of 45% less 10% less 3% on all hardware they purchase. **51.99%**
21. The Super Market Food Company receives a discount of 45% less 15% less 5% on all drug items they purchase. **55.59%**
22. The Junior Varsity Stationery Store receives a discount of 35% less 8% less 5% on all paper products purchased from the Fire-Proof Paper Company. **43.19%**
23. The College Book Store receives a 20% less 2% discount on all text books purchased from the Paperback Publishing Company. **21.6%**
24. The College Book Store receives a 35% less $12\frac{1}{2}\%$ discount on all ball-point pens purchased from the Marker Pen Company. **43.13%**
25. The Television Home Entertainment Centre receives a discount of 30% less 10% on all sets purchased from the Satellite Sight and Sound Company. **37%**
26. The Birks Company buys jewellery at 50% less 20%. **60%**
27. The Secord Company buys candy at 43% less 10%. **48.7%**
28. The Stanfield Company buys men's wear at 44% less 4%. **46.24%**
29. The Matler Company buys tops at 38% less 9%. **43.58%**

QUESTIONS

1. What is a sales discount?
 2. What is a cash discount?
 3. What is a trade discount?
 4. What is a chain discount?
 5. What is the complement of a number less than 1?
 6. Would a discount of 40% less 25% be equivalent to a discount of 25% less 40%? (Hint: Find the single discount equivalent to each.)
 7. Why do wholesalers use chain discounts instead of single discounts?
 8. If you know the discount, how can you find what percent of the list price the net cost is?
 9. How do you find the single discount equivalent to a chain discount?
 10. If the chain discount consists of only two discounts, how can you find the single discount equivalent?
- In problems 26 through 30, find the single discounts equivalent to the chain discounts using the alternate method.
26. The Sherwood Company buys sporting goods at 45% less 6%. **48.3%**

BUYING AND SELLING MERCHANDISE

CHAPTER 11

Research/Discuss

☐ *If you are in business for yourself, you are your own boss. The financial rewards may also be greater if you are successful. There are other personal satisfactions. However, you usually end up working long hours and have to risk a fair amount of money. Discuss the possibility of some individuals being more suited for owning their own business.*

☐ *These last two questions can be utilized to introduce a discussion of retail business practices. Discuss profits made on luxury goods as opposed to necessities. Emphasize the fact that the businessman must compete with other businesses selling similar products. They must, therefore, keep prices at a competitive level if they are to survive.*

RESEARCH/DISCUSS

- ☐ There are over 500 000 small businesses in Canada today.
- ☐ What are the advantages and disadvantages of going into business for yourself?
- ☐ What kinds of businesses have a high percentage of profit on their sales? What kinds have smaller percentages of profit?
- ☐ If raising the price on a product increases the profit, will a businessman necessarily increase the price of the product?

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ three ways to think about possible profits
- ☐ to compute margin and mark-up
- ☐ ways of setting the selling price based on the desired percent of profit
- ☐ how to separate the sales tax from the gross income without keeping exact records
- ☐ how to prepare an operating statement
- ☐ the meaning of gross and net profit, and how to compute them

BALANCE SHEET

December 31, 1975

ASSETS		LIABILITIES AND CAPITAL	
Current Assets: ① Cash \$5 500 Accounts Receivable 10 800 Inventory 17 480 <u>Total Current Assets</u> \$33 780		Current Liabilities: ③ Notes Payable \$2 950 Accounts Payable 11 800 <u>Total Current Liabilities</u> \$14 750	
Fixed Assets: ② Land \$4 000 Building 31 600 (Less depreciation) Fixtures 7 300 (Less depreciation) <u>Total Fixed Assets</u> 42 900		Fixed Liabilities: ④ Land Mortgage \$1 490 Building Mortgage 14 700 <u>Total Fixed Liabilities</u> \$16 250	
<u>Total Assets</u> \$76 680		Total Liabilities \$31 000 Capital 45 680 <u>Total Liabilities and Capital</u> \$76 680	

A balance sheet indicates the financial position of a company at a certain time. It is based on the accounting equation

$$\text{Assets} = \text{Liabilities} + \text{Capital}$$

Assets are what the company *owns*, such as land, buildings, equipment, furniture and fixtures, cash, and other tangible and intangible items. *Liabilities* are the amounts of money that a business *owes* such as mortgages, bank and business loans. *Capital* is the *net worth* of the business. It is arrived at by subtracting the liabilities from the assets of the business. The net worth represents the owner's investment in the business. The balance sheet *must* balance at all times. This can be illustrated by the following example. Suppose a relative of yours gives you a sum of \$20. Your cash assets has increased by \$20. Since you do not have to repay the \$20, you incur no liabilities while your net worth increases by \$20.

$$\text{Assets} = \text{Liabilities} + \text{Capital (net worth)} \quad \$20 = \$20$$

You will notice that you have a balanced balance sheet showing a \$20 cash asset and a \$20 net worth.

① The current assets are cash and those assets that will become cash during the year. Included are actual cash in the bank, accounts receivable (amounts owed the business by customers but not yet paid), and inventory (cost value of the furniture on hand).

② Fixed assets are those assets owned by the company that are not intended for resale. [Note that the building and fixtures depreciate (lose value) over the years. This depreciation is considered in the preparation of the balance sheet.]

③ Current liabilities are due within one year. Included are notes payable (principal payments on bank loans) and accounts payable (amounts owed by the company to suppliers).

④ The fixed liabilities are not due within one year. Included are mortgages and long term loans which will be repaid over a longer period than a year.

Discussion Question: What are some common causes of a net loss?

Consider: The selling price may be too low; expenses are too high; cost prices too high; unexpected expenses, such as fire or theft.

Explain that gross profit is an accounting term and that margin and mark-up are terms used in retailing. Emphasize that the three terms are interchangeable.

Discussion Question: What is the relation between retail prices and volume of sales? How does this relation effect the net profit?

Consider: The effect high prices may have on retail sales; the location and type of business.



A successful businessman must operate his business at a profit. He purchases his goods at *cost price* and sells them at a higher price (*retail price*). The difference between the cost price and retail price is known as the *gross profit*. The business must also pay operating expenses such as rent, insurance, taxes, salaries, and other sundry expenses which are subtracted from the gross profit. What is left over is known as the *net profit*.

EXAMPLE

	SELLING PRICE	\$420
less	COST PRICE	— 320
equals	GROSS PROFIT	100
less	OPERATING EXPENSES	— 60
equals	NET PROFIT	\$ 40

A businessman must set his selling prices so that he will realize a net profit. In order to do so, he must be constantly aware of his operating expenses for the particular time period, and be able to estimate the amount of goods he will be able to sell.

On the basis of the above information, he sets the selling price. If his predictions are wrong he could sustain a loss.

Mark-up, mark-on, margin, and margin of profit all mean the same thing. They all refer to the difference between the retail (selling) price and the cost price. Sometimes the mark-up or margin is written as a percent, and sometimes it is written in dollars and cents. A businessman might say that a mark-up for an item is 40% of the selling price. Or, he might say that the mark-up is \$1.85. This means that 40% of the selling price is \$1.85.

EXAMPLE

A hardware store buys a garden hose for \$2.00. They want to sell it for \$3.29. Find the mark-up (margin) in dollars and cents and as a percent of the selling price.

Find the mark-up in dollars and cents.

$$\begin{aligned}\text{Mark-up} &= \text{Selling Price} - \text{Cost Price} \\ &= \$3.29 - \$2.00 \\ &= \$1.29\end{aligned}$$

Write the mark-up as a percent of the selling price.

$$\begin{aligned}\frac{\$1.29}{\$3.29} &= 0.392 \\ &= 39.2\%\end{aligned}$$

- The mark-up is \$1.29 and it is 39.2% of the selling price.

Margin, mark-up, and margin of profit all mean the difference between the retail price of an item and its cost price.

FACTS AND FIGURES

Total bank loans rose by 16 percent during 1971 compared with 1.6 percent in 1970. General Loans, which include business and personal loans rose by 19.6 percent in 1971 compared to 5.2 percent the previous year. Residential mortgages on the banks' balance sheets rose by 56 percent during 1971, compared to 10 percent in 1970. Loans for the purchase of Canada Savings Bonds rose by 0.27 percent, while bank purchases of provincial, municipal, and corporate securities rose by 39 percent.

The fastest growing group of financial institutions in 1971 was the Credit Unions and Caisse Populaires Group, which benefited from the high rate of personal savings and favourable conditions in both the mortgage market and the personal loan sector. Their share of total financial assets has now reached the same level as finance companies, about 6 percent.

Facts and Figures

What does the increase in loans mean for growth of the Canadian economy?

What effect does increased spending have on higher prices?

Why are credit unions so popular?

EXAMPLE

A druggist buys a camera for \$55.00 and prices it for sale at \$109.50. Find his margin of profit as a percent of the selling price.

Find the margin in dollars and cents.

$$\begin{aligned}\text{Margin} &= \text{Selling Price} - \text{Cost Price} \\ &= \$109.50 - \$55.00 \\ &= \$54.50\end{aligned}$$

Write the margin as a percent of the selling price.

$$\begin{aligned}\frac{\$54.50}{\$109.50} &= 0.498 \\ &= 49.8\%\end{aligned}$$

■ His margin of profit is 49.8%.

Project: Visit a retailer and ask him to explain to you what expenses must be paid out of his margin of profit (gross profit). Find out what percent of his gross profit is used in expenses.

EXERCISES Find the mark-up in dollars and cents and as a percent of the selling price.

SELLING PRICE	COST PRICE	SELLING PRICE	COST PRICE
1. \$2.50	\$2.00 \$0.50; 20%	2. \$5.75	\$4.00 \$1.75; 30.4%
3. \$6.70	\$5.00 \$1.70; 25.4%	4. \$13.35	\$8.00 \$5.35; 40.1%
5. \$15.40	\$10.00 \$5.40; 31.5%	6. \$25.00	\$12.50 \$12.50; 50%
7. \$27.30	\$15.00 \$12.30; 45.1%	8. \$26.75	\$19.25 \$7.50; 28%
9. \$35.95	\$24.45 \$11.50; 32%	10. \$30.50	\$25.00 \$5.50; 18%
11. \$64.65	\$37.50 \$27.15; 42%	12. \$77.80	\$49.00 \$28.80; 37%
13. \$96.98	\$54.30 \$42.68; 44%	14. \$105.55	\$57.00 \$48.55; 46%
15. \$112.50	\$75.00 \$37.50; 33¹/₃%	16. \$126.90	\$92.00 \$34.90; 27.5%

Prices are in most cases determined by supply and demand—what the buyer is willing to pay and the seller is willing to take.

Discussion Question: What factors would cause the price of beef to increase or decrease?

Consider: weather conditions for growing grain, demand for beef by consumers, tariffs on imports of beef, and so on.

Why is it important for a businessman to decide upon the amount of mark-up? If the mark-up is too high, the goods will be priced higher than competition and no one will buy. If the mark-up is too low, the businessman may not be able to pay his operating expenses for the particular period. It is essential that the businessman set his price in tune with competition and at the same time realize a net profit for his efforts.

Different types of businesses have different mark-ups. If the item is considered a luxury, the mark-up will be high. If it is a necessity, the mark-up will be low.

Jewellery items are considered luxuries, while food falls into the category of necessity.

Suppose we know the cost price and the desirable margin of profit. If we divide the cost price by the complement of the margin of profit, we have the desired selling price.

$$\text{Selling Price} = \frac{\text{Cost Price}}{\text{Complements of Margin of Profit}}$$



The complement of a number is the difference between that number and 1.00.

EXAMPLE

A pulsating sprinkler costs a dealer \$4.50. Find the selling price that will give a 50% margin of profit.

Find the complement of the margin of profit.

$$\text{Margin} = 50\% = 0.50 = 0.5$$

$$\text{Complement} = 1.00 - 0.5 = 0.5$$

Divide the cost price by the complement.

$$\frac{\$4.50}{0.5} = \$9.00$$

- A selling price of \$9.00 will give a 50% margin of profit.

EXAMPLE

A wooden book shelf costs the dealer \$109.50. Find the selling price that gives a profit of 47½%.

Find the complement of the margin of profit.

$$\text{Margin} = 47\frac{1}{2}\% = 0.475$$

$$\text{Complement} = 1.00 - 0.475 = 0.525$$

Divide the cost price by the complement.

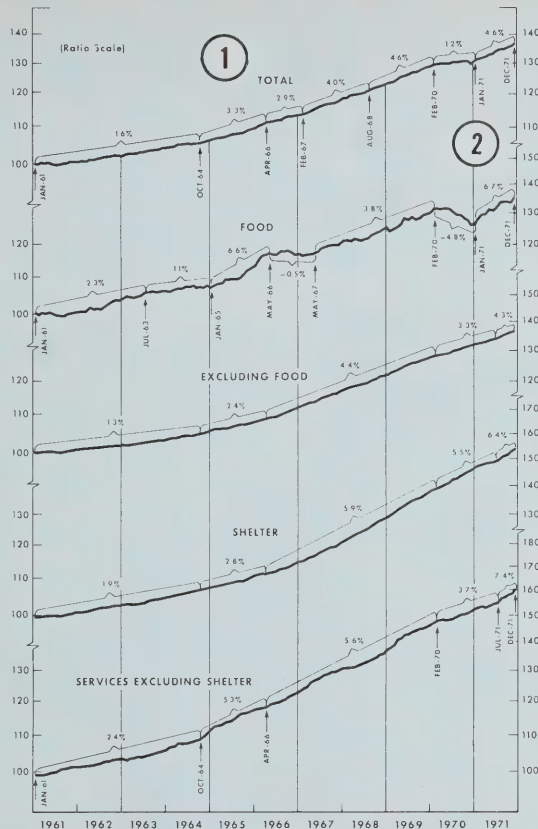
$$\frac{\$109.50}{0.525} = \$208.57$$

- A selling price of \$208.57 will give a profit of 47½%.

CONSUMER PRICE INDEX

(Monthly, Seasonally Adjusted)

1961 = 100



Percentages are compounded annual rates of change between periods indicated.
They are presented to provide a suitable perspective for assessing most recent developments.

This graph shows the consumer price index from 1961 to 1971. Note that it is based on a 1961 base of 100.

① The total consumer price index increased from 100 to almost 140 ten years later.

② Notice the resurgence of food prices from January to December 1971.

EXERCISES Find the selling prices that give the desired margin of profit.

ITEM	COST PRICE	MARGIN	ITEM	COST PRICE	MARGIN
1. Gold ring	\$9.75	75% \$39.00	2. Candy bar	\$0.064	40% \$0.11
3. Hammer	\$1.35	42% \$2.33	4. Automobile	\$2650.00	23% \$3441.00
5. Golf ball	\$0.70	50% \$1.40	6. Chair	\$14.90	43% \$26.14
7. Table	\$35.00	45% \$63.64	8. Jar of pickles	\$0.38	20% \$0.48
9. Watch	\$27.00	60% \$67.50	10. Screwdriver	\$0.45	44% \$0.80
11. Wallet	\$3.50	45% \$6.36	12. Pen & pencil set	\$4.75	48% \$9.13
13. Man's shoes	\$16.00	40% \$26.67	14. Women's shoes	\$12.50	46% \$23.15
15. Typewriter	\$115.00	42½% \$200.00	16. Bicycle	\$50.00	33⅓% \$75.00

11 C / MARK-UP AS PERCENT OF COST PRICE

Mark-up can also be expressed as a percent of the *cost* price. A Cost Base Mark-up Table is used (table 11.1). One column gives the desired margin of profit; the other gives the corresponding mark-up as a percent of the cost price. To find a selling price,



- Find the margin of profit desired.
- Find the corresponding percent in the adjacent column.
- Multiply the percent times the cost price.
- Add this percentage to the cost price.

Show how the table is constructed, using \$1.00 as cost:

$$\begin{aligned}\text{Mark-up} &= 30\% \text{ of cost price} \\ &= 0.30 \times \$1.00 \\ &= \$0.30\end{aligned}$$

$$\begin{aligned}\text{Selling price} &= \$0.30 + \$1.00 \\ &= \$1.30\end{aligned}$$

$$\text{Margin} = \frac{\$0.30}{\$1.30} = 0.231 = 23.1\%$$

COST BASE MARK-UP TABLE

Mark-up as Percent of Cost Price	Margin of Profit
10%	9.1%
15%	13.0%
20%	16.7%
25%	20.0%
30%	23.1%
35%	25.9%
40%	28.6%
45%	31.0%
50%	33.3%
55%	35.5%
60%	37.5%
65%	39.4%
70%	41.2%
75%	42.9%
80%	44.4%
85%	45.9%
90%	47.4%
95%	48.7%
100%	50.0%
125%	55.6%
150%	60.0%
175%	63.6%

table 11.1

EXAMPLE

Mr. Merchant wishes to sell book ends that cost \$6.00 a pair at 45.9% margin of profit. From table 11.1, find the mark-up in dollars and cents. Compute the selling price.

Find the margin of profit desired. (45.9%)

Find the corresponding percent in the adjacent column.

85% corresponds to 45.9%

Multiply the percent times the cost price.

$$85\% = 0.85 = 0.85$$

$$0.85 \times \$6.00 = \$5.10$$

Add this percentage to the cost price.

$$\$5.10 + \$6.00 = \$11.10$$

- The mark-up is \$5.10; the selling price is \$11.10 for a 45.9% margin of profit.

Check: Mark-up = \$5.10

Selling price = \$11.10

$$\frac{\$5.10}{\$11.10} = 0.459 = 45.9\%$$

EXAMPLE

The Hallway Greeting Card Company buys get well cards for 18¢ each. Find the mark-up in dollars and cents for a 60% margin of profit and compute the selling price.

Multiply the percent corresponding to the 60% margin of profit times the cost price.

$$150\% = 1.50 = 1.5$$

$$1.5 \times \$0.18 = \$0.27$$

Add this percentage to the selling price.

$$\$0.27 + \$0.18 = \$0.45$$

- The mark-up is 27¢; the selling price is 45¢ for a 60% margin of profit.

Check: Mark-up = \$0.27

Selling Price = \$0.45

$$\frac{\$0.27}{\$0.45} = 0.60 = 60\%$$

Project: Make a survey of retail stores to find out what methods they use to mark-up their merchandise. Specifically, find out if they use tables, formulas, or the manufacturers' suggested list prices.

EXERCISES Find the mark-up in dollars and cents and compute the selling price for the required margin of profit. Use table 11.1.

COST PRICE	MARGIN OF PROFIT	COST PRICE	MARGIN OF PROFIT
1. \$1.00	50% \$1.00; \$2.00	2. \$2.50	47.4% \$2.25; \$2.75
3. \$2.75	39.4% \$1.79; \$4.54	4. \$4.25	55.6% \$5.31; \$9.56
5. \$5.00	48.7% \$4.75; \$9.75	6. \$7.35	60% \$11.03; \$18.38
7. \$9.25	45.9% \$7.86; \$17.11	8. \$9.85	42.9% \$7.39; \$17.24
9. \$10.46	31% \$4.71; \$15.17	10. \$14.33	25.9% \$5.02; \$19.35
11. \$18.24	20% \$4.56; \$22.80	12. \$26.25	33 ¹ / ₃ % \$13.13; \$39.38
13. \$47.50	37 ¹ / ₂ % \$28.50; \$76.00	14. \$64.12	63.6% \$112.21; \$176.33
15. \$75.00	13% \$11.25; \$86.25	16. \$92.10	60% \$138.15; \$230.25

Students should be aware of what the sales tax rate is in your province or city, and whether sales tax is charged on all items.

Some businesses do not keep separate accounts for sales and for sales taxes. When a sale is made, the *sum* of the sale and the sales tax is recorded on the cash register. Then when the sales taxes have to be paid by the business, they are deducted from the total. This is done by dividing the total by the sale tax rate plus 100%. For instance, if the sales tax is 5%, the divisor would be 105% or 1.05.



- The quotient is the amount of sales.
- The difference between the total and the sales is the sales tax.

EXAMPLE

The quarterly combined sales and sales taxes for the Ray Vaughn & Joe King Company is \$50 325.30. The sales tax rate is 5%. Find the sales and the sales taxes for the quarterly period.

$$\begin{aligned} \text{Sales} &= \$50\,325.30 \\ &\quad 1.05 \\ &= \$47\,928.86 \\ \text{Sales Taxes} &= \$50\,325.30 - \$47,928.86 \\ &= \$2\,396.44 \end{aligned}$$

Show how to check the answer by multiplying the tax rate by the sales:

$$\$47\,928.86 \times .05 = \$2396.44$$

CITY OF VANCOUVER
DEPARTMENT OF PERMITS AND LICENSES

1976 LICENSE
EXPIRES DECEMBER 31ST, 1976

ACCOUNT DATE REFERENCE: 34765

1 The Wood Mart
6654 Maltra Rd
Vancouver, B.C.

2

THE ABOVE NAMED, HAVING PAID THE UNDERNOTED FEES IS HEREBY LICENSED TO CARRY ON THE BUSINESS, TRADE, OCCUPATION OR CALLING STATED HEREIN. THIS LICENSE IS ISSUED SUBJECT TO THE PROVISIONS OF ALL BY-LAWS OF THE CITY OF VANCOUVER NOW OR HEREFTER IN FORCE AND TO ALL AMENDMENTS THAT MAY HEREAFTER, DURING THE CURRENCY OF THIS LICENSE, BE MADE TO SAID BY-LAWS.

BUSINESS, TRADE, OCCUPATION OR CALLING	DIVISION	NUMBER	FEES PAID
Handicraft Shop	0	1019	\$10.00

CASH RECEIPT
JAN 1 1976
VAN-2387 (REV)
CONSUMER
071-614 RECEIPT

THIS LICENSE MUST BE POSTED IF POSSIBLE IN A CONSPICUOUS PLACE UPON THE LICENSED PREMISES

If a businessman does retail selling, he usually must obtain a permit from his state government.

- ① The name and address of the business is written here.
- ② A number is recorded here. When the retailer orders merchandise from a wholesaler, he includes this number on his purchase order. This shows that he is purchasing the goods for resale. He will also use this number when he reports his sales taxes to the province.
- ③ The city's name is indicated here.

EXAMPLE

The monthly sales and sales taxes for the S. F. Dutton Company are \$75 529.82. The sales tax rate is $3\frac{1}{2}\%$. Find the sales and sales taxes for the month.

$$100\% + 3\frac{1}{2}\% = 103\frac{1}{2}\% = 1.035$$

$$\text{Sales} = \frac{\$75\,529.82}{1.035}$$

$$= \$72\,975.67$$

$$\begin{aligned}\text{Sales Taxes} &= \$75\,529.82 - \$72\,975.67 \\ &= \$2617.15\end{aligned}$$

FACTS AND FIGURES

More than 700 000 Canadians are employed in retailing, and there are about 152 000 retail stores in Canada, ranging from the small store operated by a working-employer to large enterprises whose sales are reckoned in millions of dollars.

In 1956, independent stores handled 81.8 percent of total sales, and chain stores handled 18.2 percent; now chain stores handle more than 35 percent of total sales. There are more than 500 shopping centres with 8000 stores in Canada today. Most of the chain stores have branches in these centres. More than 10 000 retail stores are affiliated in voluntary groups operated by and through food wholesalers; annual sales total some \$2.5 billion.

In 1972, the total retail trade for Canada amounted to almost \$34 billion.

Facts and Figures

What percentage of the total Canadian labour force are employed in the Retail trade?

Why have chain stores increased in popularity? List some chain stores found in your community.

Why are shopping plazas popular in Canada today?

What factors cause independent retail food outlets to form voluntary groups?

In 1956 total retail trade was \$14 billion. What factors had contributed to an increase in 1972?

EXERCISES Find the sales and sales taxes for these combined totals. The sales tax rate is given.

TOTALS	RATE		TOTALS	RATE	
1. \$15 057	5%	\$14 340; \$717	2. \$23 790	3%	\$23 097.09; \$692.91
3. \$46 279	4%	\$44 499; \$1779.96	4. \$55 284	2%	\$54 200; \$1084
5. \$67 531	5%	\$64 315.24; \$3215.76	6. \$75 064	3%	\$72 877.67; \$2186.33
7. \$91 819	5%	\$87 446.67; \$4372.33	8. \$102 462	2%	\$100 452.94; \$2009.06
9. \$215 934	5%	\$205 651.43; \$10 282.57	10. \$363 865	6%	\$343 268.87; \$20 596.13
11. \$469 725	$4\frac{1}{2}\%$	\$449 497.61; \$20 227.39	12. \$537 138	$3\frac{1}{2}\%$	\$518 973.91; \$18 164.09
13. \$712 342	$2\frac{1}{2}\%$	\$69 496.80; \$17 374.20	14. \$916 123	$4\frac{1}{2}\%$	\$876 672.73; \$39 450.27

11 e / COST OF GOODS SOLD

Until now we have studied cost and margin of profit for *single* items. However, owners and managers of companies usually want to know *total* profits for certain periods. How can we determine total profits? We begin by finding the cost of the goods sold.

Suppose we know

- (1) the cost of goods on hand at the beginning of the period (*beginning inventory*),
- (2) the cost of goods purchased during the period, and
- (3) the cost of goods on hand at the end of the period (*ending inventory*).

Then,

Beginning Inventory + Purchases = Total Goods Available for Sale

Total Goods Available for Sale – Ending Inventory = Total Sold

The “total sold” is the *cost* price of the sold merchandise, *not* the retail price.



EXAMPLE

On September 30, the ending inventory of Harold's Sport Shop was \$22 000. The purchases for the month were \$18 000. The ending inventory on October 30 was \$16 000. Find the Cost of Goods Sold for October.

Beginning Inventory	\$22 000
Plus Purchases (October)	+ 18 000
Total Goods Available for Sale	<u>\$40 000</u>
Less Ending Inventory	<u>– 16 000</u>
Cost of Goods Sold	\$24 000

- The cost price of the goods sold during the month of October was \$24 000.



The ending inventory for any period is also the beginning inventory for the next period.

EXAMPLE

On December 31, 1975 the ending inventory for Fay's Boutique was \$32 543.75. During the year 1976, total purchases after deducting

Project: Visit several retail stores and find out what forms or methods they use for making an inventory. Obtain several forms, if possible, and fill in the various items.

purchase returns was \$56 350.25. The ending inventory of December 31, 1976 was \$38 564.75. Find the cost of goods sold for the year 1976.

Beginning Inventory (31/12/75)	\$32 543.75
Plus Purchases (1976)	+ 56 350.25
Total Goods Available for Sale	\$88 894.00
Less Ending Inventory	— 38 564.75
Cost of Goods Sold (1976)	\$50 329.25

■ The cost price of the goods sold during 1976 was \$50 329.25.

- Answers to Exercises.
- | | |
|-----------------|-----------------|
| 1. \$1710.11 | 2. \$711.42 |
| 2. \$2596.93 | 4. \$3655.26 |
| 5. \$2878.04 | 6. \$1867.66 |
| 7. \$991.77 | 8. \$1954.39 |
| 9. \$8631.66 | 10. \$2873.22 |
| 11. \$8904.94 | 12. \$20 209.10 |
| 13. \$35 498.55 | 14. \$37 415.81 |
| 15. \$52 413.48 | 16. \$68 146.41 |

INVENTORY SHEET

Red, White and Blue Sport Shop

Freeport, Nova Scotia

DATE <u>March 31, 1975</u>			PREPARED BY <u>R. M. Smith</u>		
③			②		
STOCK NO.	QUANTITY	UNIT PRICE	DESCRIPTION	① UNIT PRICE	EXTENSION
S 16	46	each	Whist Compass	\$1.13	\$51.98
L 24	72	pair	Boot Socks	.50	41.76
R 55	16	each	Sleeping Bag	15.00	240.00
R 36	23	each	Air Mattress	5.38	123.74
R 76	11	each	Kerosene Lantern	1.13	12.43
R 87	5	each	Stove	7.78	38.90
R 50	32	each	Cotton Tarp	7.31	233.92
R 34	8	each	Pup Tent	9.89	79.12

An inventory sheet is an example of an internal form—it is used within the company itself. Stock must be counted by hand in all locations—stock storage, on the sales floor, in display windows, and so on.

① The unit prices are the cost prices for the merchandise *not* the retail prices.

② Extension equals the unit cost times the quantity.

③ Almost all stores keep track of merchandise by using both a stock number and a description of the item.

EXERCISES Find the cost of goods sold for each.

BEGINNING INVENTORY	MONTHLY PURCHASES	ENDING INVENTORY	BEGINNING INVENTORY	MONTHLY PURCHASES	ENDING INVENTORY
1. \$5375.28	\$610.78	\$4275.95	2. \$8328.49	\$912.33	\$8529.40
3. \$9375.07	\$1074.67	\$7852.81	4. \$13 473.59	\$1935.02	\$11 753.35
5. \$15 642.54	\$1748.19	\$14 512.69	6. \$19 063.97	\$1381.26	\$18 577.57
7. \$24 486.58	\$2428.56	\$25 923.37	8. \$29 913.26	\$2603.97	\$30 562.84
9. \$42 818.91	\$4978.47	\$39 165.72	10. \$54 189.13	\$4347.50	\$55 663.41
11. \$73 928.72	\$6392.87	\$71 416.65	12. \$185 238.05	\$15 605.46	\$180 634.41
13. \$285 398.45	\$30 347.38	\$280 247.28	14. \$371 274.69	\$35 387.32	\$369 246.20
15. \$473 985.32	\$50 264.27	\$471 836.11	16. \$558 057.75	\$60 326.65	\$550 237.99

11 f / NET PROFIT

Discuss again the possibility of a net loss if expenses exceed gross profit, or if the cost of goods sold exceeds the sales.

After we have determined the cost of goods sold, and the total retail sales, we can find the gross profit. We subtract the cost from the sales. Then, if we subtract the operating expenses from the gross profit, we arrive at the *net profit*.

$$\text{Sales} - \text{Cost of Goods Sold} - \text{Operating Expenses} = \text{Net Profit}$$



Operating expenses will include such items as rent, salaries, advertising, insurance, taxes, delivery costs, supplies, maintenance, utilities, and so on.

EXAMPLE

Prepare an operating statement showing the net profit for the month of November for the Campus Bookstore. The following data are given in the records.

Retail Sales (November)	\$11 025
Inventory (October 31)	6875
Purchases (November)	8100
Inventory (November 30)	8300
Operating Expenses	2240

THE CAMPUS BOOKSTORE

Operating Statement

For the Month Beginning November 2, 1975

<i>Sales</i>	<i>\$11 025</i>
<i>Cost of Goods Sold:</i>	
<i>Beginning Inventory, November 1, 1974</i>	<i>\$6875</i>
<i>Plus Purchases</i>	<i>+ 8100</i>
<i>Cost of goods available for sale</i>	<i>\$14 975</i>
 <i>Deduct:</i>	
<i>Ending Inventory, November 30, 1974</i>	<i><u>— 8300</u></i>
 <i>Cost of Goods Sold</i>	<i><u>6675</u></i>
<i>Gross Profit</i>	<i>\$ 4350</i>
<i>Operating Expenses</i>	<i><u>2240</u></i>
<i>Net Profit</i>	<i><u>\$ 2110</u></i>

To make comparisons easier, certain items on an operating statement are often shown in percents of sales as well as in dollars. Thus, for the example above, the sales would be 100%, the cost of goods sold would be 61% of sales, and the gross profit would be 39% of sales. The operating expenses would be 20% of sales and the net profit would be 19% of sales.

The company's net profit for November is 19% of sales.



EXERCISES Prepare operating statements for these businesses. The records are for the month of October 1975. Use the format shown above. [Answers are in back of book](#)

1. Catherine's Gift Shop

Sales	\$38 227
Beginning Inventory	\$92 696
Purchases	\$21 554
Ending Inventory	\$89 325
Operating Expenses	\$7128

2. Jim's Hardware Store

Sales	\$59 114
Beginning Inventory	\$151 922
Purchases	\$37 850
Ending Inventory	\$148 995
Operating Expenses	\$14 100

3. Larry's Men's Wear

Sales	\$59 595
Beginning Inventory	\$121 263
Purchases	\$48 457
Ending Inventory	\$125 832
Operating Expenses	\$9025

4. Jean's Dress Shop

Sales	\$44 601
Beginning Inventory	\$75 245
Purchases	\$48 774
Ending Inventory	\$62 265
Operating Expenses	\$5196

5. Mary Lee's Furniture Mart

Sales	\$175 307
Beginning Inventory	\$295 392
Purchases	\$142 853
Ending Inventory	\$285 975
Operating Expenses	\$28 402

6. Edna's Gourmet Shop

Sales	\$6830
Beginning Inventory	\$9376
Purchases	\$2284
Ending Inventory	\$8942
Operating Expenses	\$1892

Find these missing amounts.

SALES	COST OF GOODS SOLD	GROSS PROFIT	OPERATING EXPENSES	NET PROFIT
7. \$58 432	\$37 962	\$20 470	\$14 242	<u>\$6228</u>
8. \$74 528	\$45 260	\$29 268	<u>\$20 803</u>	\$8465
9. \$88 216	\$49 989	<u>\$38 227</u>	\$25 484	\$12 743
10. \$112 000	<u>\$68 785</u>	\$43 215	\$25 752	\$17 463
11. <u>\$326 227</u>	\$180 562	\$145 665	\$120 133	\$25 532
12. \$243 592	\$135 516	<u>\$108 076</u>	\$76 714	\$31 362

REVIEW / BUYING AND SELLING MERCHANDISE

CHECKLIST

Beginning inventory (p. 120)
 Cost of goods sold (p. 120)
 Cost price (p. 112)
 Ending inventory (p. 120)
 Gross profit (p. 112)
 Margin (p. 112)
 Margin of profit (p. 112)
 Mark-on (p. 112)
 Mark-up (p. 112)
 Net profit (p. 112)
 Operating expenses (p. 122)
 Operating statement (p. 122)
 Purchases (p. 120)
 Retail price (p. 112)
 Sales taxes (p. 118)
 Selling price (p. 112)

PROBLEMS

In problems 1 through 8, write the margin as a percent of the selling price.

1. A shirt costing \$7.25 sells for \$12.95. 44%
2. A pair of slacks costing \$10.58 sells for \$21.95. 51.8%
3. A book costing \$2.75 sells for \$6.95. 60.4%
4. A record player costing \$49.50 sells for \$89.95. 45%
46.7%
5. A hi-fi stereo unit costing \$159.50 sells for \$299.50.
6. A watch costing \$125.00 sells for \$299.50. 58.3%
7. A hockey stick costing \$3.75 sells for \$6.95. 46%
8. Cologne costing \$2.19 sells for \$3.98. 45%

In problems 9 through 16, find the selling prices that will give the desired margin of profit.

9. Hockey gloves that cost \$11.75 with a margin of profit of 55%. \$26.11
10. A hockey puck that cost \$0.45 with a margin of profit of 45%. \$0.82
11. Hockey pads that cost \$11.55 with a margin of 60%. \$28.88
12. Colour film that cost \$0.49 at a margin of 75%. \$1.96
13. A bottle of perfume that cost \$1.75 at a margin of 65%. \$5.00
14. A dart board that cost \$4.75 with a margin of 52%.
\$9.90

15. A hockey game that cost \$5.50 at a margin of 47½%. \$10.48
16. A walking-talking doll that cost \$4.45 at a margin of 57½%. \$10.47

In problems 17 through 24, find the mark-up in dollars and cents and compute the selling price for the desired margin of profit. Use table 11.1.

17. A paper weight that cost \$1.75 with a margin of 39.4%. \$1.14; \$2.89
18. An electric clock that cost \$5.95 with a margin of 45.9%. \$5.06; \$11.01
19. A pen set that cost \$4.85 with a margin of 44.4%.
\$3.88; \$8.12
20. A world globe that cost \$5.50 with a margin of 47.4%. \$4.95; \$10.45
21. An AM-FM portable radio that cost \$19.45 with a margin of 35.5%. \$10.70; \$30.15
22. A fluorescent desk lamp that cost \$4.83 with a margin of 48.7%. \$4.59; \$9.42
23. A book that cost \$1.75 at a margin of 33.3%.
\$0.88; \$2.63
24. A bookcase that cost \$28.88 at a margin of 31.0%.
\$12.98; \$41.86

In problems 25 through 32, find the provincial sales tax from these combined totals of sales and sales taxes.

25. The provincial sales tax rate is 3% \$11 546. \$346.38
26. The provincial sales tax rate is 3% \$12 210. \$366.30
27. The provincial sales tax rate is 4% \$13 458. \$538.32
28. The provincial sales tax rate is 4% \$15 650. \$626.00
29. The provincial sales tax rate is 5% \$10 976. \$548.80
30. The provincial sales tax rate is 5% \$ 9556. \$477.80
31. The provincial sales tax rate is 6% \$15 430. \$925.80
32. The provincial sales tax rate is 7% \$ 8355. \$584.85

In problems 33 through 40, find the missing amounts.

	BEGINNING INVENTORY	PURCHASES	ENDING INVENTORY	COST OF GOODS SOLD
33. \$65 756		\$ 25 154	\$63 455	\$27 455
34. \$70 236		\$16 753	\$ 66 134	\$20 855
35. \$45 337		\$12 686	\$50 107	\$ 7916
36. \$57 318		\$10 355	\$53 557	\$14 116
37. \$40 518		\$ 7382	\$38 350	\$ 9550

38.	\$26 514	\$5554	<u>\$24 748</u>	\$7320
39.	\$30 455	\$6536	\$28 271	<u>\$ 8720</u>
40.	<u>\$96 330</u>	\$22 750	\$87 540	\$31 540

In problems 41 through 44, prepare operating statements to find the net profits. *Answers are in back of book.*

41. The Scott Jewellery Store

Month of September

Sales	\$20 000
Beginning Inventory	\$12 000
Purchases	\$15 000
Ending Inventory	\$10 000
Operating Expenses	\$ 1000

42. The Supreme Hardware Store

Month of November

Sales	\$6732
Beginning Inventory	\$9725
Purchases	\$4864
Ending Inventory	\$9839
Operating Expenses	\$2359

43. The Antique Shop

Month of January

Sales	\$22 500
Beginning Inventory	\$10 000
Purchases	\$16 450
Ending Inventory	\$ 9300
Operating Expenses	\$ 8356

44. The Flea Market

Month of December

Sales	\$25 625
Beginning Inventory	\$ 9300
Purchases	\$20 790
Ending Inventory	\$11 630
Operating Expenses	\$11 950

QUESTIONS

1. Distinguish the meanings of the following terms: gross profit, margin, and mark-up.
2. What factors must a businessman take into account when determining the mark-up for his goods?
3. Why do items such as jewellery and furniture carry a higher mark-up than food and clothing?
4. What procedure is used to obtain a certain percent of profit on the selling price?
5. Explain how the Cost Base Mark-up Table works.
6. Can the percent of gross profit on the selling price equal or exceed 100%?
7. How would a businessman compute his sales taxes if he did not keep separate records for sales and taxes?
8. How do you find the cost of goods sold in a particular month for a business?
9. What method is used to determine whether a business has made a profit or loss during a particular month?

The Payment Game



For Eric the summer's end came with feelings of both satisfaction and disappointment. The group had succeeded. True, *The Second Bananas* hadn't exactly been signed-in for the Banff Springs, but they survived the summer in presentable Calgary night spots. Even the Stampede Room had them as an extra one weekend.

He should have saved more of those July dollars! They had been so easy to spend as the weeks went by, and now, with school only three days away, the harsh financial facts were realized. He had dreamed of new equipment. Now the only hope would be for a good deal on second-hand units, and even then the price would have to be approaching someone's "sacrifice sale."

Jerry, their drummer, called over to him. "Thinking about that new guitar you want so much? I heard that the guitar man with *Hungry Cluster* is selling everything."

"Oh, yeah," replied Eric. "I know him. He's finishing up at the junior college and going east. I'll give him a call tomorrow and see what he has."

Riding home, Eric did some mental arithmetic. He could spare about \$125—maybe a little more—from his savings account for new instruments. And he could get

at least \$200 for his own, if he could find a buyer. The guitar had had a rough season, but he knew he had taken good care of it. If the jobs kept coming in, he could plan on \$25 or \$30 each month for a payment. He didn't want to make payments for too long—not longer than the end of the school year. It wasn't good to be tied down any longer than that. He did some figuring on an old envelope. Considering the quality of what he wanted to get, even six hundred dollars didn't seem like quite enough money.

The next afternoon he found that he was right. When he saw the equipment the man from *Hungry Cluster* was selling, he knew that he wanted it.

"It cost me more than \$1200. I have to get at least \$850 for it," he told Eric. "And since I'm going east, I'll need the cash right away. I can't take monthly payments."

Eric ran his fingers over the smooth neck of the guitar one more time. "Ok," he said, "Let me see what I can do. I'll let you know next week."

On the way home he stopped at the Three Bees Music Company to do a little comparison shopping. Equipment equivalent to what he'd just seen was about \$1350.

"We'll take yours in on trade," the manager told him. "I think we can let you have about \$350 for it. You'd have to finance the balance of \$1000 with us."

He did some figuring with his desk calculator. "If you want to complete the payments in 12 months, that would make your payments \$98.34 each month." Eric was dubious.

"Another way to handle it is on a bank credit card. One advantage of that method is that you could pay uneven instalments. Don't you have more jobs around the Christmas holidays? If you had several good jobs in a row, you could pay it off faster. Of course, since you're a minor, your parent's signature would be necessary in either case."

Eric decided to talk to his older brother, Bill.

"The best deal I can find is the one where I have to have the cash," he told him. "And cash is what I don't have. Do you think I could borrow it from someone in the family?"

"Not from me," Bill laughed. "But seriously, I don't think anyone can spare it right now. Not for instruments for a rock band. Besides, you should avoid borrowing from relatives and friends. If something goes wrong, there's often more than just a broken business matter to fix.

"You do have a life insurance policy though. Dad took out one for each of us when we were born. You could find out it if has a cash value. If it does, the insurance company will loan it to you at 6 or 7 percent interest."

"How about going to a bank?" Eric asked.

"These days they are charging between 9 and 13 percent. And you'd need a co-signer or some collateral. Something else you might consider is the Co-op Credit Union. Dad belongs to that and maybe he could get a loan and you could repay him."

"You have lots of ideas," said Eric. "But how about that loan company down on Payson Road?"

"You could go there if nothing else works. Their interest rates are really high. Probably a lot of people they make loans to don't pay them back. That makes their cost of doing business high."

"You've given me so many alternatives! What do you think I should do?" asked Eric.

"Well, Eric," said his brother, "no one can tell you what to do. It's got to be your own decision. Look into the details of all the alternatives we've been talking about. You're the only one who can say how much of a sacrifice you're willing to make for this investment in good equipment. You've got to consider your own desires for new equipment and how long it will take you to run an ad or find a buyer for what you have now. You could even try to find out if a discount house in the city could send you what you want at a lower price than Three Bees—and it would be new, and likely last longer than what you'd be getting from your friend from *Hungry Cluster*. But after you dig out all the information, you've just got to decide for yourself."

"Gosh Bill," said Eric with admiration, "how'd you get so smart?"

Bill grinned and punched him lightly on the ear, "It runs in the family, stupid! "

Research/Discuss

- *Most students should already know that you should report a lost or stolen chequebook to your bank to protect yourself if*

CHAPTER 12

the cheques are fraudulently used. However, this question can be used to present the correct way to fill out a cheque to prevent forgery or alteration of the amount.

- *Mention that cheques eliminate the risks of carrying cash. Also, the cancelled cheque is evidence of payment; and it can be used as a record of expenses for budgetary purposes.*

- *Use these three questions*
- *to introduce a discussion*
- *of the various services provided by banks in addition to chequing and savings accounts.*

- *Students may be willing to discuss experiences of their family members or of acquaintances. But bank policies vary. Have certain students investigate the question and report to the class.*

BANKING SERVICES

RESEARCH/DISCUSS

- Should you report a lost or stolen chequebook to your bank?
- What are some reasons for paying bills by cheque rather than with cash?
- What are travellers cheques? How are they used?
- What are money orders? How are they used?
- What do people with safety deposit boxes keep in them?
- What happens if you overdraw your chequing account?

IN THIS CHAPTER YOU WILL LEARN . . .

- about regular and special chequing accounts
- how to reconcile a bank statement
- an efficient way to account for outstanding cheques
- some of the ways banks compute service charges
- how to decide whether money should be kept in savings or chequing accounts
- about some of the other services banks offer their customers

The most common service offered by a bank is a chequing account. After a person opens a chequing account, he receives a book of cheques and deposit slips.

- ① The cheques are personalized—each printed with Mr. Conchie's name and address.
- ② For a small charge, each cheque may be numbered. This provides an easy way for Mr. Conchie to keep track of his cheques.
- ③ Each bank has a different number.

THE TORONTO-DOMINION BANK
4799 YONGE ST. & SHEPPARD AVE.
WILLOWDALE, ONT.
M2N 5M5

PERSONAL CHEQUING ACCOUNT

2 No. _____

5 _____ 19 _____

PAY TO THE ORDER OF _____ \$ _____

_____ DOLLARS

1 BRUCE E. CONCHIE
92 HOLLYWOOD AVE.
WILLOWDALE, ONT.

3 _____

4 _____

511 12 1976 2004 618 2 21085

④ The bank number and Mr. Conchie's account number are printed in digits a computer can read.

⑤ Mr. Conchie writes the amount of the cheque in both figures and words.

When Mr. Conchie deposits money in his chequing account, he uses one of his personalized deposit slips.

① The deposit slips are also printed with Mr. Conchie's name, address, and his bank.

② The bank number and branch is printed on the deposit slip.

③ The deposit slip also has Mr. Conchie's account number.

Both the bank number and Mr. Conchie's account number are in digits a computer can read.

THE TORONTO-DOMINION BANK
4799 YONGE ST. & SHEPPARD AVE.
WILLOWDALE, ONT.
M2N 5M5

PERSONAL CHEQUING ACCOUNT

1 _____ 19 _____

DEPOSITED BY

2 _____

3 _____

BRUCE E. CONCHIE
92 HOLLYWOOD AVE.
WILLOWDALE, ONT.

511 12 1976 2004 618 2 21085

CURRENCY			
COIN			
CHEQUES OR COUPONS (List on Reverse if Necessary)			
TOTAL			
LESS Received in Cash			
Signature			
AMOUNT OF DEPOSIT \$			

12 a / RECONCILING A CHEQUING ACCOUNT

A chequing account is one of the many services provided by banks. Since there are various kinds of chequing accounts, you can choose the one that is best for your needs. For any account you have, you should reconcile the balance in your chequebook or cheque register with the balance on your monthly bank statement.

At the end of each month, the bank sends you a statement showing the deposits, withdrawals, and balance of your account. Your cancelled cheques are returned with the statement. Usually the balance on the bank statement is not the same as the balance in your chequebook or register. There are several reasons for this:

- (1) Some of the cheques in your chequebook have not yet been paid by the bank—usually because the person to whom you issued the cheque is still holding it and has not yet deposited it. These are called *cheques outstanding*.
- (2) Deposits entered in your chequebook or register may not have been entered on the bank statement before it was mailed. These are called *deposits in transit*.
- (3) There may be a service charge that you have not yet entered in your chequebook or register. This is called a *bank debit memo*.
- (4) Either you or the bank may have made an arithmetical error.

IN ACCOUNT WITH: MR. PAUL CARON, 26 DOLLARD AVE., MARIÉ, ONTARIO

STATEMENT PAGE NO. 3 FOR PERIOD ENDED: MAR 18, 1973 ACCOUNT NO. 1460 241265 DATE F.W.D. FEB 16/73 BALANCE F.W.D. 1 803.72

CHEQUES	DEPOSITS	DATE		BALANCE
		MONTH	DAY	
① 75.04		FEB	19	1 757.68
27.82		FEB	20	1 629.86
50.00		FEB	21	1 499.86
130.00		FEB	22	1 257.86
11.75	194.89	FEB	23	1 372.58
② 16.31	20.00	FEB	27	1 295.27
20.00	21.00	FEB	28	1 252.87
42.40		MAR	01	1 136.87
115.00A		MAR	02	1 034.07
2.80	100.00	MAR	05	955.88
78.39		MAR	06	719.62
6.00	230.06	MAR	08	709.62
10.00		MAR	09	1 300.62
④ 6.00	600.00	MAR	15	1 303.62
7.80B		MAR	16	1 300.82

LEGEND: A. AUTHORIZED ITEM, B. ERROR CORRECTION, C. DEPOSITED CHECK, D. SERVICE CHARGE, E. DEBIT INTEREST, F. BANK DEBIT MEMO

NO. DEPOSITS 2, AMOUNT \$ 679.34, NO. CHEQUES 20, AMOUNT \$ 1 182.24, FINAL BALANCE OF THIS STATEMENT

IF YOU HAVE ENTERED IN YOUR CHEQUE BOOK REGISTER ALL CHEQUES ISSUED AND DEPOSITS MADE, THIS STATEMENT CAN BE EASILY BALANCED. IF ANY CHARGES AND CREDITS HAVE BEEN MADE TO YOUR ACCOUNT BY THE BANK AS INDICATED BY SYMBOLS BESIDE THE AMOUNTS, THESE SHOULD ALSO BE ENTERED IN YOUR CHEQUE BOOK REGISTER.

1. ON YOUR CHEQUE BOOK REGISTER CHECK OFF ALL ITEMS WHICH ARE SHOWN ON THE STATEMENT.

2. FROM CHEQUE BOOK REGISTER LIST ALL CHEQUES NOT CHECKED OFF AND TOTAL THESE.

TOTAL- 1 803.72

FINAL BALANCE SHOWN ON THIS STATEMENT \$ 1 803.72

ADD AMOUNT OF ANY DEPOSIT MADE AFTER STATEMENT CLOSING DATE \$

TOTAL \$

DEDUCT TOTAL OF CHEQUES AS LISTED ABOVE \$

BALANCE SHOULD AGREE WITH CHEQUE BOOK REGISTER \$

The front of a bank statement shows what has happened in the account during the reporting period, e.g. from 1½ to 1⅓.

① Cheques paid are listed in the columns "cheques," and the balance is shown for each day that cheques are paid.

② Deposits are shown in the third column, indicating the date of the deposit and the balance on that day.

③ An overdraft is shown by "OD" after the balance, and a minimum service charge is made of \$2.00 for the overdraft.

④ \$2.10 was charged as a service charge, i.e. cheques at \$0.14 per cheque.

⑤ The account activity is summarized at the bottom.

The reverse side of your statement has directions for reconciling the account as explained on next page.

① This is the amount shown on the statement as the final balance.

② Add the amount of any deposits made after the closing date on the bank statement.

③ Add ① and ②.

④ List all cheques from chequebook register that are not shown on the statement. Total these. Deduct ④ from ③.

⑤ Balance should agree with chequebook register.

Note: remember to enter into your register all bank service charges, credits, etc. which are shown on your statement but not in your register.

By reconciling your chequebook with the bank statement, you can find any clerical errors and you will be less likely to overdraw your account.

EXAMPLE

Reconcile this chequing account. The balance shown on the bank statement is \$492.10. There is a deposit in transit of \$335.27. The outstanding cheques are: #702 (\$110.00), #703 (\$27.52), #704 (\$3.95), #705 (\$46.20), and #706 (\$22.35). The balance in the

Balance on bank statement	\$492.10	
Plus deposits in transit	+ 335.27	
	<u>\$827.37</u>	
Less cheques outstanding		
#702	\$110.00	
#703	27.52	
#704	3.95	
#705	46.20	
#706	<u>22.35</u>	
		— \$210.02
		<u>\$617.35</u>
Plus bank debit memo	+ 3.85	
Balance in chequebook		<u>\$621.20</u>

Answers to Exercises.

1. Balance Plus Deposits in Transit	\$1397.73
Less Cheques Outstanding	— 693.75
Balance in Chequebook	<u>\$ 703.98</u>
2. Balance Plus Deposits in Transit	\$ 938.28
Less Cheques Outstanding	— 337.61
Balance in Chequebook	<u>\$ 600.67</u>
3. Balance Plus Deposits in Transit	\$ 831.10
Less Cheques Outstanding	— 139.65
	<u>\$ 691.45</u>
4. Balance Plus Deposits in Transit	\$ 890.96
Less Cheques Outstanding	— 485.76
	<u>\$ 405.20</u>
Plus Bank Debit Memo	+ 2.95
Balance in Chequebook	<u>\$ 408.15</u>

chequebook is \$621.20. There is a bank debit memo, a service charge, for \$3.85 since the balance was below the required minimum.

The bank debit memo must be recorded in the chequebook and subtracted from the chequebook balance.



EXERCISES Reconcile these chequing accounts.

- Balance on bank statement is \$1397.73. There are no deposits in transit. The cheques outstanding are: #348 (\$105.00), #350 (\$22.44), #351 (\$21.00), #352 (\$439.00), #354 (\$52.45), #356 (\$17.86), #357 (\$36.00). The balance in the chequebook is \$703.98.
- Balance on bank statement is \$738.28. There is a deposit in transit of \$200.00. The cheques outstanding are: #864 (\$10.00), #878 (\$105.00), #879 (\$53.69), #881 (\$100.75), #882 (\$11.75), #883 (\$8.75), #884 (\$2.00), #885 (\$26.67), #886 (\$19.00). The balance in the chequebook is \$600.67.
- The balance on the bank statement is \$831.10. There are no deposits in transit. The cheques outstanding are: #50 (\$25.00), #79 (\$3.00), #80 (\$25.00), #81 (\$26.00), #82 (\$5.00), #83 (\$50.00), #85 (\$3.15), #88 (\$2.50). The balance in the chequebook is \$691.45.
- The balance on the bank statement is \$640.96. There is a deposit in transit of \$250.00. The cheques outstanding are: #19 (\$26.83), #31 (\$22.87), #32 (\$69.50), #33 (\$297.31), #34 (\$56.00), #35 (\$13.25). There is a bank debit memo of \$2.95. The balance in the chequebook is \$408.15.

12 b / LISTING THE OUTSTANDING CHEQUES

You can keep a systematic record of which cheques have been paid and which are outstanding.

- (1) Sort your cancelled cheques for the month in numerical order beginning with the smallest number.
- (2) Refer to your list of cheques outstanding for the previous month and mark off those that have now been paid by the bank.
- (3) Mark off in your chequebook the paid cheques that are not on the cheques outstanding list for the previous month.
- (4) List the unmarked cheques (those on the previous list and those in your chequebook) and the amount of each cheque in numerical order by cheque numbers.

This list is the new cheques outstanding list to be used in reconciling your chequing account.

Auditors use a checkmark called a tick mark to mark off amounts. It looks like this:
\$10.00✓

One method of recording cheques uses cheque stubs. The information on the stub should be recorded before the cheque is torn out.

- ① The balance brought forward is found on the last line of cheque #100.
- ② The deposit was made some time between writing cheque #100 and cheque #101.
- ③ The amount of this cheque is subtracted to find the current balance.
- ④ This amount will be copied on the "Bal. For'd" line of the stub for cheque #102.

NO. 101 Aug 23 1976 DATE

COLLECTIBLE WITHOUT CHARGE TO THE TORONTO CLEARING HOUSE

THE TORONTO-DOMINION BANK

4799 YONGE ST. & SHEPPARD AVE.,
WILLOWDALE, ONTARIO

August 23 1976

PAID TO FREMONT SUPPLIERS

THE TORONTO-DOMINION BANK

4799 YONGE ST. & SHEPPARD AVE.,
WILLOWDALE, ONTARIO

August 23 1976

PAID TO THE ORDER OF Fremont Suppliers

\$ 12.33

Twelve 33/100 DOLLARS

BRENNIC STUDIOS

Ralph Brennic

618 1 1976 2 0041 618 3 7968 1

CHECK NO.	DATE	CHECK ISSUED TO	AMOUNT OF CHECK	DATE OF DEP	AMOUNT OF DEPOSIT	BALANCE
100	10/8	Riddle Dept Store	50 00	✓		148 68
						→ 98 68
101	23/8	Fremont Grocery	12 33	15/8	506 45	605 13
						→ 592 80

A cheque register, rather than cheque stubs, is sometimes used to record chequeing account activity. The information for each cheque should be recorded before the cheque is torn out.

- ① Recent cheques and deposits can be seen at a glance.
- ② Balance amounts do not have to be recopied—this avoids a possible source of error.
- ③ Note that horizontal addition and subtraction are required to find the current balance.

EXAMPLE

Prepare a list of cheques outstanding for the month of May. The cheques outstanding for the month of April are:

#49	\$ 6.40	#59	\$100.00
#56	\$175.00	#61	\$ 44.00
#57	\$ 99.00	#62	\$100.00

The paid cheques for the month of May are: #49, #56, #57, #59, #62, #64, #65, #66, #67, #70, #72. The cheque record for the month of May shows cheques written as follows:

#63	\$110.00	#68	\$ 24.27
#64	\$ 25.76	#69	\$ 30.55
#65	\$ 99.00	#70	\$ 9.30
#66	\$ 8.76	#71	\$ 19.75
#67	\$ 9.98	#72	\$ 35.00

We compare the paid cheques for May with the outstanding list for April and the chequebook record for May. The cheques outstanding as of the end of May are:

#61	\$ 44.00
#63	\$110.00
#68	\$ 24.27
#69	\$ 30.55
#71	\$ 19.75
Total	\$228.57

In the example above, all of the cheques outstanding as of the end of April were paid except #61. This cheque was put on the cheques outstanding list as of the end of May. The rest of the list is cheques written in May and not yet paid by the bank. The total (\$228.57) would be used to reconcile the chequing account.

Project: Ask your parents if you may reconcile a bank statement for them.

Answers to Exercises.

1. Cheque No.	Amount
137	\$20.00
138	\$25.50
139	\$75.00
140	\$ 5.95
141	\$18.63
Total	\$145.08

2. Cheque No.	Amount
16	\$ 5.00
19	\$15.27
26	\$ 9.30
27	\$20.55
28	\$ 5.50
29	\$14.00
Total	\$69.62

EXERCISES Prepare the list of cheques outstanding.

1. Graham had a list of unpaid cheques as of the end of July as follows: #127 (\$15.75), #128 (\$32.38), #129 (\$25.19), #130 (\$105.50). When he received his bank statement for the month of August, he sorted the paid cheques in numerical order. They were #127, #128, #129, #130, #131, #132, #133, #134, #135, #136. His chequebook for August showed he had written the following cheques: #131 (\$45.78), #132 (\$122.89), #133 (\$50.00), #134 (\$17.50), #135 (\$8.25), #136 (\$33.22), #137 (\$20.00), #138 (\$25.50), #139 (\$75.00), #140 (\$5.95), #141 (\$18.63).
2. Hester's cheques outstanding for January were: #13 (\$4.62), #14 (\$102.00), #15 (\$1.39), #16 (\$5.00), #18 (\$15.08), #19 (\$15.27), #20 (\$11.90). Her bank statement for February contained these paid cheques: #13, #14, #15, #18, #20, #21, #22, #23, #24, #25. Her chequebook showed that these cheques had been written during February: #21 (\$14.72), #22 (\$11.90), #23 (\$75.00), #24 (\$17.75), #25 (\$100.00), #26 (\$9.30), #27 (\$20.55), #28 (\$5.50), #29 (\$14.00).

12 C / TYPES OF BANK ACCOUNTS AND SERVICE CHARGES

Service charges depend on the type of account which you might have at the bank.

PERSONAL CHEQUING ACCOUNT

This type of account is for the person who pays most of their bills by cheque and, therefore, writes quite a few cheques per month.

The service charge is \$0.14 for every withdrawal or cheque, which is added to the bank statement monthly. This account earns no interest.

EXAMPLE

Mary-Anne has a personal chequing account and writes 12 cheques during the month of April. What will be the service charge on her bank statement at the end of the month?

$$12 \text{ cheques} \times \$0.14 \text{ per cheque}$$

$$12 \times \$0.14 = \$1.68$$

- The total service charge will be \$1.68.

CHEQUING/SAVINGS ACCOUNT

This type of account allows you to earn a small interest on a savings account and at the same time offers chequing conveniences. The chequing/savings account would be most useful to a person who only writes one or two cheques per month.

The service charge is \$0.20 per entry, deposit or withdrawal cheque. However, for every \$100 in your account, in a three-month period you are allowed one free cheque. Therefore, if your quarterly balance was \$600, you would be allowed 6 free cheques.

The chequing/savings account earns you 3% interest p.a. calculated quarterly on the minimum balance for that quarter.

EXAMPLE

Roger has his savings in a chequing/savings account. His minimum quarterly balance for the three months ending March was \$200. During the three months Roger wrote 6 cheques. What will be the interest and service charges?

Interest for a year would be 3%

$$\frac{3}{100} \times \$200 = \$6.00$$

Interest for the quarter is

$$\$6.00 \times \frac{1}{4} = \$1.50$$

- The interest for the quarter ending in March is \$1.50.

Since you are allowed one free cheque for every \$100, Roger was allowed to write 2 free cheques.

Service charges for the other 4 cheques is

$$4 \text{ cheques} \times \$0.20 \text{ per cheque}$$

$$4 \times \$0.20 = \$0.80$$

- The service charge for the cheques is \$0.80.

CURRENT ACCOUNT

This account is used most by businesses and works the same as the personal chequing account.

SAVINGS ACCOUNT

This is strictly a savings account which allows no cheques to be written. The current rate of interest paid to customers with savings accounts is $8\frac{1}{4}\%$ calculated on the minimum monthly balance and paid every 6 months.

Many people find that saving money is difficult. Most banks will transfer funds automatically to make savings easier. You simply fill out a card which is then kept in the bank's files.

Project: Contact a trust company and compare the chequing and savings accounts, service charges, hours of business, etc. to that of your bank.

THE ROYAL BANK

Office Channing No. 72 Date 12/6/76

You are hereby authorized to transfer \$ 60.00
to my Savings Account Number 1211/0078

Br. / Account
from my Checking Account Number 1211/1622 ← ①

Br. / Account
on the 15th day of each month. This authority is to
remain in force until revoked by me in writing.

Signature of Customer Jamie C. Morrison

Authority Revoked _____ ③ Date _____

Transfer # 1 or # 2 (Circle correct transfer no.) ← ②

NEW CHANGE REVOKED (Circle one.)

Form No. 93 St. 1174

SPECIAL SERVICE PLANS

Most banks today are offering a special plan to their customers. Basically, for a charge of approximately \$2.50 the customer gets the full use of all the banking services available without any additional costs. This might include services such as safety deposit box discounts, purchasing of travellers cheques, transfers from one account to another, unlimited cheque writing, and so on.

Again, whether a customer has a special service plan or not, will depend on the amount of cheques written each month and what other banking services are used.

Project: Find out if the banks in your area have special accounts. What are the charges? Is there any charge if no cheques are written during the month?

EXAMPLE

1. Norman keeps a minimum balance of \$600 in his chequing account and doesn't pay a service charge to the bank. If this money were in a savings account, it would earn \$30 interest per year. How much per month is it costing Norman to have a chequing account?

Find the amount of interest per month that Norman would get if he put his \$600 in a savings account.

$$\frac{1}{12} \times \$30.00 = \$2.50$$

- It is costing Norman \$2.50 per month to have his chequing account.

2. If Norman writes an average of 10 cheques per month, what is the average cost per month for each cheque written?

Divide the amount of interest he loses by the average number of cheques he writes.

$$\frac{\$2.50}{10} = \$0.25$$

- It costs an average of \$0.25 for each cheque he writes.

3. How much would Norman save per month if he had a special chequing account that charged \$0.15 for each cheque he wrote?

Find the savings on each cheque.

$$10 \times \$0.15 = \$1.50$$

Find the savings for an average of 10 cheques per month.

- Norman would save \$1.50 per month by putting his \$600 in a savings account and opening a special chequing account in which no minimum balance was required.

EXAMPLE

Hilary has a special chequing account and writes an average of 18 cheques per month. He pays a fee of \$0.20 per cheque. He also has a savings account with a balance of \$300 that earns \$15 interest per year. If Hilary opened a regular chequing account and transferred his \$300 to it, he would not have to pay a fee for his chequing account. Should Hilary do this?

Find the loss of interest per month.

$$\frac{1}{12} \times \$15.00 = \$1.25$$

Find the gain per month from not paying for each cheque written.

$$18 \times \$0.20 = \$3.60$$

Find the net gain per month.

$$\$3.60 - \$1.25 = \$2.35$$

- Hilary should change from a special chequing account to a regular chequing account since he would save \$2.35 per month.

EXERCISES Answer these questions based on types of bank accounts.

1. Eric has a personal chequing account and wrote 15 cheques in February. What is the service charge if each cheque cost \$0.14. **\$2.10**
2. Rhonda has a personal chequing account and wrote 11 cheques in November. What is the service charge if each cheque cost \$0.14. **\$1.54**
3. Marilyn has a savings/chequing account. Interest is 3% per annum. Her minimum quarterly balance was \$274. Marilyn made 3 deposits and wrote 6 cheques. What is the interest earned for the quarter? **\$2.06**
4. Gayle has a savings/chequing account. Interest is 4% per annum. Her minimum quarterly balance is \$250. Gayle made 3 deposits, 2 withdrawals, and wrote 11 cheques. What is the interest earned for the quarter? Calculate the service charges for the quarter? **\$2.50**
\$3.00
5. Barbara has a savings account. Interest is $8\frac{1}{2}\%$. What interest would be earned in a year. Her minimum monthly balance was \$600. **\$51.00**
6. Paul has a personal chequing account. He writes on the average of 22 cheques per month. What is the average monthly service charge? **\$3.08**
Would it be advantageous if Paul had a special service plan? Explain.
It would be to his advantage because for \$2.50 you can write all the cheques you wish.

12 d / ADDITIONAL BANKING SERVICES

Project: Visit your local bank and find out the procedures necessary for renting a safe-deposit box. What are the various charges?

Banks offer many services in addition to chequing and savings accounts. For instance, most banks have a fireproof, burglarproof vault containing hundreds of small metal *safe-deposit boxes*. The smallest boxes rent for as little as \$7.50 a year. Anything that fits in the box may be stored there, such as

- (1) valuable papers: stock and bond certificates, savings account passbooks, insurance policies, contracts, birth and marriage certificates, deeds of trust, or wills.
- (2) valuable property: stamps, coins, or jewellery
- (3) irreplaceable property of sentimental value: old letters, family photographs, or keepsakes.

Two keys are required to open a safe-deposit box. One key belongs to the renter, and the other is held by the vault custodian, an employee of the bank. Either key alone will not open the box. The renter must identify himself to the custodian by signing his name on a piece of paper. The signature is then compared with the signature filed at the time the box was leased. This prevents unauthorized persons who might have possession of the key from using it.

Banks also sell *travellers cheques*, which can be used instead of cash. They are available in denominations of \$10, \$20, \$50, and \$100. The usual fee is 1% of the amount purchased. For example, the fee for \$300 worth of travellers cheques is 1% of \$300 or \$3.00. When the cheques are purchased, you are asked to sign each one. When you cash a cheque, you again sign the cheque, this time in the presence of the payee. The payee compares two signatures; and if they agree, he accepts the cheque. If travellers cheques are lost or stolen, the institution issuing the cheques will replace them when the details of the loss and the denominations and serial numbers of the missing cheques are reported.

The person who accepts a travellers cheque compares the two signatures on the cheque. This practice helps detect fraud. If your cheque were stolen, the thief would have to forge your name while the payee watched.

- ① When you buy a travellers cheque, you sign it here before leaving the bank.
- ② When you cash the cheque, you sign it here in the presence of the person cashing it.
- ③ Travellers cheques are negotiable all over the world.

Carol Marston → ①

WHEN COUNTERSIGNED BELOW WITH THIS SIGNATURE

C0000000

 CANADIAN IMPERIAL BANK OF COMMERCE

TRAVELLERS CHEQUE

10 TEN

NEGOTIABLE WITHOUT CHARGE AT ANY BRANCH OF ANY CHARTERED BANK IN CANADA

SPECIMEN

TEN DOLLARS CANADIAN CURRENCY

WILL PAY TO THE ORDER OF

Carol Marston → ②

COUNTERSIGN HERE IN PRESENCE OF PERSON CASHING

110000000 1100950 1010 0 6040

VALID FOR USE IN CANADA ONLY

Discussion Question: Can you think of any other services a bank might perform? Consider: Money management counseling; estate trustee ship; loans, and so on.



Rather than send cash through the mail, Michael Liepner obtained this money order from the Canadian Imperial Bank of Commerce. Mr. Leon Steinberg will then deposit this cheque in his account.

① Mr. Liepner gave the bank teller \$1.97 in cash plus a small service charge and received this cheque.

② Printed with a cheque-writing machine, this amount is difficult to alter.

If you need to send money in the mail and don't have a chequing account, you can purchase a *bank draft* from a bank. Then if it is lost or stolen, the bank will issue another cheque to replace it.

Answers to Exercises.

6. details of loss and serial numbers and denominations of missing cheques.
7. the purchaser, the payee, the date, the amount, the bank employee's signature.

EXERCISES Answer these questions.

1. What papers and valuables might your family store in a safe deposit box? *answers vary*
2. You wish to buy \$250 worth of travellers cheques. If the fee is 1%, how much money will you need to get the cheques? *\$252.50*
3. You decide to buy \$350 worth of travellers cheques. If you want the number of cheques divided as equally as possible between \$10 and \$20 cheques, how many of each denomi-

nation would you get?

eleven \$10 cheques; twelve \$20 cheques

4. Where do you sign the travellers cheques when they are purchased? *upper left*
5. Where do you sign the travellers cheques when you cash them? *lower left*
6. What information must you provide to have lost cheques replaced?
7. What information is entered on a money order?

CHECKLIST

Balance (p. 130)
Bank debit memo (p. 130)
Bank draft (p. 139)
Bank statement (p. 130)
Cancelled cheque (p. 132)
Cheque register (p. 130)
Chequebook (p. 130)
Cheques outstanding (p. 130)
Chequing account (p. 130)
Chequing/Savings account (p. 134)
Current account (p. 135)
Deposit (p. 130)
Deposit in transit (p. 130)
Interest (p. 136)
Minimum quarterly balance (p. 134)
Money order (p. 139)
Overdrawn account (p. 131)
Paid cheque (p. 132)
Personal chequing account (p. 134)
Reconciliation (p. 130)
Safe-deposit box (p. 138)
Savings account (p. 135)
Service charge (p. 134)
Travellers cheque (p. 138)
Withdrawal (p. 130)

PROBLEMS

In problems 1 through 4, prepare the lists of cheques outstanding and reconcile the bank balances.

1. For February, Ray's balance in his cheque register was \$689.58. The balance on his bank statement was \$483.50. A deposit of \$302.10 was in transit. The cheques outstanding for January were: #86 (\$48.12), #89 (\$9.56), #90 (\$32.17), #91 (\$25.03). These cheques were written in February: #92 (\$105.00), #93 (\$14.27), #94 (\$31.15), #95 (\$40.00), #96 (\$8.53), #97 (\$18.29), #98 (\$26.25), #99 (\$50.00), #100 (\$15.50). These cheques were paid by the bank during February: #86, #89, #90, #91, #92, #94, #95, #96, #97. There was a bank debit memo for \$10.00 for the rent on his safe-deposit box for one year.

2. Bud's balance in his cheque register for March was \$257.24. There were no deposits in transit. The balance on his bank statement was \$472.28. The cheques outstanding for February were: #165 (\$29.43), #167 (\$15.00), #168 (\$7.85), #169 (\$109.00), #170 (\$46.72). His cheque register showed these cheques were written in March: #171 (\$12.88), #172 (\$10.00), #173 (\$31.16), #174 (\$28.33), #175 (\$17.00), #176 (\$48.50), #177 (\$20.29), #178 (\$19.75), #179 (\$50.00), #180 (\$110.00). These cheques were paid by the bank in March: #165, #168, #169, #170, #171, #172, #173, #174, #175, #176.

3. Edie's cheque register balance at the end of December was \$553.27. There was a deposit in transit of \$296.43. The cheques outstanding for November were: #223 (\$79.00), #224 (\$13.54), #225 (\$26.42), #226 (\$35.00). These cheques were written during December: #227 (\$43.44), #228 (\$15.20), #229 (\$5.00), #230 (\$52.25), #231 (\$19.00), #232 (\$22.50), #233 (\$36.39), #234 (\$120.00), #235 (\$15.18), #236 (\$23.00), #237 (\$11.50), #238 (\$24.48). The bank paid these cheques during December: #223, #224, #225, #227, #228, #229, #230, #231, #232, #233, #234. On marking off the paid cheques, Edie found that cheque #227 for \$34.44 had been entered incorrectly in her cheque register as \$43.44. The balance on her bank statement was \$375.00.

4. Bob's cheque register at the end of May showed a balance of \$271.52. His bank statement showed a balance of \$486.27. There were no deposits in transit. The cheques outstanding at the end of April were: #295 (\$32.72), #296 (\$13.00), #297 (\$69.25), #298 (\$8.00). The cheques written in May were: #299 (\$12.00), #300 (\$45.13), #301 (\$31.50), #302 (\$8.35), #303 (\$20.00), #304 (\$55.60), #305 (\$23.00), #306 (\$100.00), #307 (\$14.50), #308 (\$21.00). These cheques were paid by the bank in May: #295, #296, #298, #300, #301, #302, #303, #304, #305. There was a bank debit memo for a service charge of \$2.00.

In problems 5 through 10, compute the service charge for each account.

5. Phil had a minimum balance of \$176.80 in his chequing/savings account for the quarter ended June. He wrote 13 cheques. **\$2.40**
6. Lindsay had a minimum balance of \$79.80 in his chequing/savings account for the quarter ended September. He wrote 2 cheques. **\$0.40**
7. Susan had a personal chequing account and wrote 9 cheques for the month of July. **\$1.26**
8. Leonard had a personal chequing account and wrote 17 cheques for the month of November. **\$2.38**
9. Judy had a minimum balance of \$674 in her chequing/savings account. She made 2 deposits, 1 withdrawal and wrote 5 cheques. **\$0.40**
10. Patrick had a personal chequing account and wrote 21 cheques during the month of October. **\$2.94**

Answers to Problems

1. Balance on Bank Statement	\$483.50
Plus Deposit in Transit	+ 302.10
	<u>\$785.60</u>
Less Cheques Outstanding	
#93 \$14.27	
#98 26.25	
#99 50.00	
#100 15.50	
	<u>- 106.02</u>
	\$679.58
Plus Bank Debit Memo	+ 10.00
Balance in Cheque Register	<u>\$689.58</u>
2. Balance on Bank Statement	\$472.28
Plus Deposits in Transit	+ 0.00
	<u>\$472.28</u>
Less Cheques Outstanding	
#167 \$ 1500	
#177 20.29	
#178 19.75	
#179 50.00	
#180 110.00	
	<u>- 215.04</u>
Balance in Cheque Register	<u>\$257.24</u>

QUESTIONS

1. What banking services do members of your family use?
2. What does it mean to reconcile a chequing account?
3. What is a deposit in transit?
4. What are cheques outstanding?
5. What is a bank debit memo?
6. What methods are used by banks to compute service charges for chequing accounts?
7. If deposits in transit, cheques outstanding, and bank debit memos have been accounted for and the balances still cannot be reconciled, what is the explanation?
8. How do you prepare a list of cheques outstanding?
9. How do you determine the true cost of keeping a chequing account?
10. What is the most economical way to keep a chequing account if very few cheques are written each month?
11. What kinds of things are kept in a safe-deposit box?
12. What is the usual fee for travellers cheques?

3. Balance on Bank Statement	\$375.00
Plus Deposits in Transit	+ 296.43
	<u>\$671.43</u>
Less Cheques Outstanding	
#226 \$35.00	
#235 15.18	
#236 23.00	
#237 11.50	
#238 24.48	
	<u>- 109.16</u>
Actual Balance	<u>\$562.27</u>
Error in #227	9.00
Balance in Cheque Register	<u>\$553.27</u>
4. Balance on Bank Statement	\$486.27
Plus Deposits in Transit	+ 0.00
	<u>\$486.27</u>
Less Cheques Outstanding	
#297 \$ 69.25	
#299 12.00	
#306 100.00	
#307 14.50	
#308 21.00	
	<u>- 216.75</u>
	\$269.52
Plus Bank Debit Memo	+ 2.00
Balance in Cheque Register	<u>\$271.52</u>

Research/Discuss

- ☐ *These answers should be elicited from students' own experiences.*
- ☐ *Probably only from friends or relatives. The government does make some*

CHAPTER 13

interest-free loans to students if certain conditions are met.

- ☐ *By selecting the institution and plan that pays the highest rate of interest. Emphasize that higher interest rates are usually available only at the expense of availability of the deposited money.*
- ☐ *Trust companies, credit unions, Canada Savings Bonds, and other Canadian obligations (bills, notes).*
- ☐ *Be sure the discussion brings out the fact that these institutions are in the business of lending money. Therefore, they must operate at a profit.*
- ☐ *Interest is the price paid for the use of money. The rates rise and fall with supply and demand; recent interest changes should be discussed.*

SIMPLE INTEREST

RESEARCH/DISCUSS

- ☐ Where can you get an interest-free loan?
- ☐ How can you increase the amount of interest earned on your savings account?
- ☐ What are some places in addition to banks where you can earn interest on your savings?
- ☐ Why do banks charge higher interest rates to their borrowers than they pay to their depositors?
- ☐ Why do interest rates rise and fall?

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ how to use the simple interest formula
- ☐ how to adapt the formula to varying interest rates and periods of time
- ☐ how to determine the number of days between two dates
- ☐ how to compute interest by using interest tables

TO: CANADIAN IMPERIAL BANK OF COMMERCE
PERSONAL LOAN DEPARTMENT

APPLICATION FOR COMMERCE BANKPLAN LOAN

Appl'n made through JASPER ST.W. AUGUST 1/75
Branch Date

A Commerce Bankplan loan for \$ 5000 is required for the following purposes:
(proceeds amount)

TERM REQUESTED 3 MONTHS

NAME (PLEASE PRINT) JAMES CARL MORRISON
GIVEN NAME SURNAME

AGE 38 BIRTHPLACE TORONTO
MARRIED OR SINGLE M WIFE'S GIVEN NAME MAXINE

ADDRESS (Street) 248 FIFTH STREET
P.O.(City or Town) EDMONTON ALBERTA

NUMBER OF DEPENDENTS: WIFE AND 2 children

TELEPHONE AT RESIDENCE 364-8143

FIRM OF COMPANY (EMPLOYER) TRANSWORLD DIAL LTD.

TELEPHONE AT BUSINESS 862-4432

ADDRESS 914 CARMICHEL DRIVE, EDMONTON

NO. OF YEARS WITH THEM 12

POSITION HELD PRODUCTION MANAGER

YEARLY EARNINGS (gross) \$ 19,000 (1)

FORMER EMPLOYMENT (IF NOT IN ABOVE POSITION 2 YEARS)

HOW LONG

OTHER INCOME, if any; source STOCKS AND BONDS

AMOUNT YEARLY \$ 1200

PARTICULARS OF ANY REAL ESTATE HELD

Year Purchased	Present Fair Val'n	Taxes Owng	OWING ON MORTGAGES OR AGREEMENTS OF SALE
1963	\$ 45000	\$ NIL	AMOUNT TERMS OF REPAYMENT
			\$ 18460 \$ 169.38 per month

Home - 2 storey brick

PARTICULARS, IF RENTING RENTAL \$

HOW LONG AT PRESENT ADDRESS? 12 YRS. HOME ☒ ROOM ☐ BOARDING ☐ APARTMENT ☐ FURNISHED APARTMENT ☐

LOANS AND DEBTS OWING OTHER THAN ON REAL ESTATE ABOVE

OWING TO	NAME	Date Incurred	Original Amount	Unpaid Balances	TERMS OF REPAYMENT
THIS OR OTHER BANKS			\$	\$	
FINANCE COMPANIES OR CREDIT UNIONS					
INSTALMENT PURCHASES { Auto. Other	GMAC	JAN 1974	42.00	500	\$ 120 per month MAKE MODEL 1974
					(2)
INCOME TAX	EATONS	MARCH 75	\$ 750.00	\$ 250.00	\$ 100.00 per month
OTHER DEBTS					

Does wife have income or property of her own? STOCKS
Please give particulars

RELATIVE OR CLOSE FRIEND NAME W.J. MORRISON ADDRESS 85 SHAW ST. RELATIONSHIP/OCCUPATION Brother

BANK ACCOUNT AT Bank of Commerce BRANCH JASPER ST.W. ACCOUNT NO. 62463

DATE OF MONTHLY PAYMENT

IF NO DEPOSIT ACCOUNT WITH BANK, IS ACCOUNT BEING OPENED?

The information on this form helps the lending institution decide whether or not to grant a loan.

① The Morrisons' monthly income is an important consideration—is their income sufficient to repay the loan in three months?

② The amount currently being paid on other loans must also be considered.

The Morrisons must provide credit reference—places where they have owed money. These references will be checked to find out if the Morrisons have repaid loans and charge accounts promptly.

The lending institution will also check with Mr. Morrison's employer and his bank. Do you think the Morrisons are a good risk for this loan?

13 a / PRINCIPAL, RATE, AND TIME

Discuss the reasons why the bank wants to know each item on the loan application form. Point out the areas where a "wrong answer" would prevent the loan being approved.

Point out that when the principal of a loan is paid on the maturity date, the borrower has the use of the entire amount for the period of the loan. This is not true if the loan is paid off in installments. Then the borrower has the use of the entire amount only until the first installment is paid.

Interest is the price paid for the use of money. For example, when you deposit money in a savings account at a bank or trust company, you are lending your money to the institution. In return for the use of your money, the bank or trust company pays you interest.

There are many different places you may borrow money—banks, credit unions, finance companies, etc. If you borrow money, say, from a bank, you must pay interest for the use of the money. The *principal* is the amount of money borrowed. If you borrow \$100 from a bank or finance company, the \$100 is called the principal of the loan. You would agree to repay the principal at a future date called the *maturity date* of the loan. The amount of interest you must pay depends on the principal and is computed at the given rate for the period of the loan. Ordinarily, the interest on a loan is payable at maturity with the principal. Other ways of paying interest will be explained in the chapters on discounting and installment financing.

Interest can be expressed in two ways: as dollars and cents or as a percent. A borrower might say “The interest on my loan is \$12.” If you asked him what the rate of the loan was, he might reply, “Twelve percent.” The *rate of interest* is a percent. Since percent means per hundred, a 12% rate of interest means that you pay \$12 interest for each \$100 principal. Also, the amount of interest is directly proportional to the amount of principal—if you double the principal, you double the amount of interest; if you triple the principal, you triple the amount of interest; and so on. Therefore, at a 12% interest rate, you pay \$12 on a \$100 loan; you pay \$24 on a \$200 loan; \$36 on a \$300 loan; and so on.

[illegible]

The lending institution asked James Morrison to obtain a co-signer—someone to be responsible for repaying the loan if he himself were unable to do so. The co-signer must provide information about himself similar to that provided by the borrower.

① William Morrison, James' brother, agrees to be co-signer.

② He must provide information about his residence—does he own the property? How long has he lived there?

③ He must provide information about his job and income—how long has he been with the company? What is his monthly income?

④ He must list credit references.

⑤ Is William Morrison a good choice for co-signer?

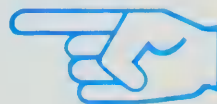
Interest rates are quoted as yearly rates.



At a 12% interest rate for a \$100 loan, you would pay \$12 if the loan was for one whole year. If the loan was for less than one year, you would pay less than \$12.

To find the simple interest for one year, multiply the principal by the rate. Remember to change the rate in a percent to a decimal number or its fractional equivalent before multiplying.

If the interest rate is 13%, change 13% to 0.13 or to $\frac{13}{100}$.



EXAMPLE

Find the interest for one year on \$325 at a rate of 12%.

Change the percent to a decimal.

$$12\% = 0.12$$

Multiply the principal by the rate.

$$\$325 \times 0.12 = \$39$$

- The interest is \$39.

Discussion Question: What are some good reasons for wanting a loan?

Consider: Purchasing a large item such as furniture or a car; paying unexpected medical bills; paying fees for education; paying taxes; and so on.

EXAMPLE

Find the interest for one year on \$412 at a rate of $12\frac{1}{2}\%$.

Change the percent to a decimal.

$$12\frac{1}{2}\% = 0.125$$

Multiply the principal by the rate.

$$\$412 \times 0.125 = \$51.50$$

- The interest is \$51.50.

EXERCISES Find the interest for one year.

PRINCIPAL

RATE

1. \$100	6%	\$6.00
3. \$350	4%	\$14.00
5. \$425	7%	\$29.75
7. \$575	$11\frac{1}{2}\%$	\$66.13
9. \$635	$10\frac{1}{2}\%$	\$66.68
11. \$765	$6\frac{1}{2}\%$	\$49.73
13. \$880	$5\frac{3}{4}\%$	\$50.60
15. \$950	10%	\$95.00

PRINCIPAL

RATE

2. \$200	5%	\$10.00
4. \$400	3%	\$12.00
6. \$500	8%	\$40.00
8. \$600	10%	\$60.00
10. \$700	$12\frac{1}{2}\%$	\$87.50
12. \$800	$7\frac{1}{2}\%$	\$60.00
14. \$900	11%	\$99.00
16. \$1000	6.9%	\$69.00

13 b / PRINCIPAL, RATE, AND TIME

\$ 500.00

On Ninety days after date, for value received,

I Stanley Witlow promise to pay to the order of

Five Hundred and no/100 ----- Dollars.

in this City, with interest thereon from May 17, 1974 at the rate of 6 per cent per annum

until paid, payable monthly, and if not so paid, to be added to and become a part of the principal and bear the same rate of interest as above specified, both principal and interest payable in lawful money of the United States of America, and in case of suit for collection of the whole or any part thereof, costs of collection and reasonable attorney's fees. In case said interest or any part thereof is not paid when due, then the whole of the unpaid principal and interest shall become immediately due and payable, at the election of the holder hereof, of which election notice is hereby waived. Presentation and demand, notice of non-payment and protest waived.

R. Peter Addison

When the loan period is stated in months, weeks, or days, we have to change it to a fractional part of a year before finding the interest.

EXAMPLE

Change 5 months to years.

There are 12 months in one year.

5 months = $\frac{5}{12}$ years.

EXAMPLE

Change 13 weeks to years.

There are 52 weeks in one year.

$$\begin{aligned} 13 \text{ weeks} &= \frac{13}{52} \text{ years} \\ &= \frac{1}{4} \text{ year} \end{aligned}$$

Facts and Figures

Why do health and welfare programs take such a large slice of the federal budget?

Why does the federal government share the cost of these services with the provinces?

FACTS & FIGURES

In 1974-75, 20 cents of the tax dollar will be spent on the federal share of provincially-operated health and welfare plans, as follows: 5-1/2 cents on hospital insurance programs, 3-1/2 cents on medical care programs, three cents on the Canada Assistance Plan, and eight cents on family and youth allowances.

The way to change days to years considers a year as 365 days. The 365-day year is called the *exact* or *accurate* year. The method is called the *exact method*. Note: a leap year is not considered. All years are assumed to have 365 days.

EXAMPLE

Change 49 days to years using the exact method.

$$49 \text{ days} = \frac{49}{365} \text{ years}$$

EXAMPLE

Change 90 days to years using the exact method.

$$\begin{aligned} 90 \text{ days} &= \frac{90}{365} \text{ years} \\ &= \frac{18}{73} \text{ years} \end{aligned}$$

FACTS AND FIGURES

The Canadian Banking system consists of the Bank of Canada, a Government-owned central bank, and ten privately-owned chartered banks. In addition, there are more than 100 Trust Companies and Mortgage Loans Companies. Also, there are now about 5000 Credit Unions, as well as many Finance Companies.

Consumer Credit Statistics, outstanding balances at December 31st, 1972:—

Chartered Banks for personal loans: 7 144 000 000

Sales Finance Companies for consumer goods: 1 035 000 000

Department stores for installment credit: 823 000 000

Furniture and Appliance stores for installment credit: 187 000 000

Small loan companies for cash loans: 1 625 000 000

Total December 31, 1972: 10 814 000 000

Facts and Figures

Which of the saving institutions offers the highest rate of interest on a deposit?

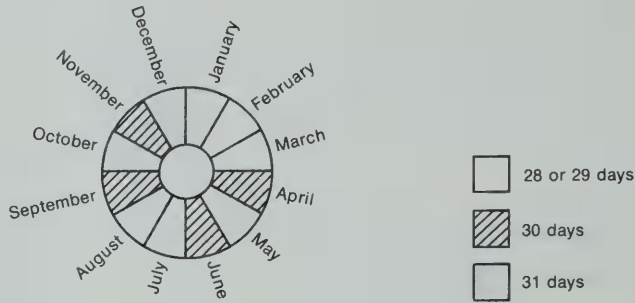
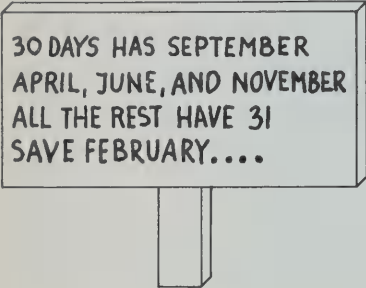
Compare the various consumer credit outstanding balances. Which has the largest outstanding balance? Why do you think this is so?

EXERCISES Express each in years. Reduce fractions to lowest terms.

- | | | | |
|------------------------------|------------------------------|------------------------------|------------------------------|
| 1. 5 days $\frac{1}{73}$ | 2. 10 days $\frac{2}{73}$ | 3. 15 days $\frac{3}{73}$ | 4. 30 days $\frac{6}{73}$ |
| 5. 31 days $\frac{31}{365}$ | 6. 35 days $\frac{7}{73}$ | 7. 45 days $\frac{9}{73}$ | 8. 60 days $\frac{14}{73}$ |
| 9. 75 days $\frac{15}{73}$ | 10. 72 days $\frac{72}{365}$ | 11. 90 days $\frac{18}{73}$ | 12. 105 days $\frac{21}{73}$ |
| 13. 120 days $\frac{24}{73}$ | 14. 180 days $\frac{36}{73}$ | 15. 225 days $\frac{45}{73}$ | 16. 270 days $\frac{54}{73}$ |

13 C / INTEREST-BEARING DAYS

The number of days until a loan is payable is the number of *interest-bearing days*. To find the number of interest-bearing days between two dates, count the last day but not the first day. If you are using the ordinary year, each month has 30 days and the days are easy to count. However, if you are using the exact year, the number of days in each month varies.



How can you tell if a year is a leap year? A year is a leap year if it is exactly divisible by 4 (zero remainder). Exceptions are the years that end in double zero (1900, 2000, 2100, and so on); they must be exactly divisible by 400. For example, the year 1900 is divisible by 4 but not by 400—it was not a leap year. The year 2000 will be a leap year.

table 13.1

Day No.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Day No.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1	32	60	91	121	152	182	213	244	274	305	335	1	366	397	425	456	486	517	547	578	609	639	670	700
2	2	33	61	92	122	153	183	214	245	275	306	336	2	367	398	426	457	487	518	548	579	610	640	671	701
3	3	34	62	93	123	154	184	215	246	276	307	337	3	368	399	427	458	488	519	549	580	611	641	672	702
4	4	35	63	94	124	155	185	216	247	277	308	338	4	369	400	428	459	489	520	550	581	612	642	673	703
5	5	36	64	95	125	156	186	217	248	278	309	339	5	370	401	429	460	490	521	551	582	613	643	674	704
6	6	37	65	96	126	157	187	218	249	279	310	340	6	371	402	430	461	491	522	552	583	614	644	675	705
7	7	38	66	97	127	158	188	219	250	280	311	341	7	372	403	431	462	492	523	553	584	615	645	676	706
8	8	39	67	98	128	159	189	220	251	281	312	342	8	373	404	432	463	493	524	554	585	616	646	677	707
9	9	40	68	99	129	160	190	221	252	282	313	343	9	374	405	433	464	494	525	555	586	617	647	678	708
10	10	41	69	100	130	161	191	222	253	283	314	344	10	375	406	434	465	495	526	556	587	618	648	679	709
11	11	42	70	101	131	162	192	223	254	284	315	345	11	376	407	435	466	496	527	557	588	619	649	680	710
12	12	43	71	102	132	163	193	224	255	285	316	346	12	377	408	436	467	497	528	558	589	620	650	681	711
13	13	44	72	103	133	164	194	225	256	286	317	347	13	378	409	437	468	498	529	559	590	621	651	682	712
14	14	45	73	104	134	165	195	226	257	287	318	348	14	379	410	438	469	499	530	560	591	622	652	683	713
15	15	46	74	105	135	166	196	227	258	288	319	349	15	380	411	439	470	500	531	561	592	623	653	684	714
16	16	47	75	106	136	167	197	228	259	289	320	350	16	381	412	440	471	501	532	562	593	624	654	685	715
17	17	48	76	107	137	168	198	229	260	290	321	351	17	382	413	441	472	502	533	563	594	625	655	686	716
18	18	49	77	108	138	169	199	230	261	291	322	352	18	383	414	442	473	503	534	564	595	626	656	687	717
19	19	50	78	109	139	170	200	231	262	292	323	353	19	384	415	443	474	504	535	565	596	627	657	688	718
20	20	51	79	110	140	171	201	232	263	293	324	354	20	385	416	444	475	505	536	566	597	628	658	689	719
21	21	52	80	111	141	172	202	233	264	294	325	355	21	386	417	445	476	506	537	567	598	629	659	690	720
22	22	53	81	112	142	173	203	234	265	295	326	356	22	387	418	446	477	507	538	568	599	630	660	691	721
23	23	54	82	113	143	174	204	235	266	296	327	357	23	388	419	447	478	508	539	569	600	631	661	692	722
24	24	55	83	114	144	175	205	236	267	297	328	358	24	389	420	448	479	509	540	570	601	632	662	693	723
25	25	56	84	115	145	176	206	237	268	298	329	359	25	390	421	449	480	510	541	571	602	633	663	694	724
26	26	57	85	116	146	177	207	238	269	299	330	360	26	391	422	450	481	511	542	572	603	634	664	695	725
27	27	58	86	117	147	178	208	239	270	300	331	361	27	392	423	451	482	512	543	573	604	635	665	696	726
28	28	59	87	118	148	179	209	240	271	301	332	362	28	393	424	452	483	513	544	574	605	636	666	697	727
29	29	...	88	119	149	180	210	241	272	302	333	363	29	394	...	453	484	514	545	575	606	637	667	698	728
30	30	...	89	120	150	181	211	242	273	303	334	364	30	395	...	454	485	515	546	576	607	638	668	699	729
31	31	...	90	...	151	...	212	243	...	304	...	365	31	396	...	455	...	516	...	577	608	...	669	...	730

EXAMPLE

Count the number of interest-bearing days between January 20, 1977 and March 15, 1977.

January:	11 days (January 21, 22 31)
February:	28 days
March:	<u>15</u> days (March 1, 2 15)
	54

- There are 54 interest-bearing days.

The number of interest-bearing days between two dates can be found using a time table such as table 13.1. To use the table, first find the number of the day of the year for both dates. Then subtract the number for the beginning date from the number of the ending date.

EXAMPLE

Find the number of days between January 21, 1975 and July 16, 1975.

*January 21 is day number 21. July 16 is day number 197.
Subtract.*

$$197 - 21 = 176$$

- There are 176 days.

EXAMPLE

Find the number of days between September 21, 1975 and February 10, 1976.

September 21 is day number 264. February 10 of the next year is day number 406. Subtract.

$$406 - 264 = 142$$

- There are 142 days.

EXERCISES Count the exact number of interest-bearing days between these dates.

- | | |
|--|---|
| 1. January 13, 1970 to April 10, 1970 87 | 2. August 8, 1971 to June 10, 1971 306 |
| 3. February 15, 1972 to May 12, 1972 86 | 4. March 10, 1973 to June 10, 1973 92 |
| 5. November 3, 1975 to December 28, 1975 55 | 6. February 16, 1977 to April 8, 1977 51 |
| 7. July 25, 1979 to October 2, 1979 69 | 8. February 28, 1980 to June 1, 1980 93 |
| 9. January 23, 1981 to March 22, 1981 58 | 10. December 2, 1982 to February 28, 1983 88 |

Using table 13.1, find the number of days between these dates.

- | | |
|--|---|
| 11. February 18, 1970 to May 20, 1970 91 | 12. January 13, 1971 to July 20, 1971 188 |
| 13. January 20, 1972 to June 17, 1972 148 | 14. April 15, 1973 to July 25, 1973 101 |
| 15. January 18, 1975 to December 31, 1975 347 | 16. March 26, 1977 to May 28, 1977 63 |
| 17. September 1, 1981 to January 27, 1982 148 | 18. October 2, 1982 to July 5, 1983 276 |
| 19. November 21, 1983 to June 30, 1984 221 | 20. December 12, 1984 to August 17, 1985 248 |

13 d / THE SIMPLE INTEREST FORMULA

We use the following formula to compute simple interest.

$$I = P \times R \times T$$

$$\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time}$$

In the formula, I is interest (in dollars), P is principal (in dollars), R is rate of interest (written as a decimal or a fraction), and T is time (expressed in years).

EXAMPLE

1. Find the interest on \$300 at 12% for 60 days.

$$I = P \times R \times T$$

$$I = \$300 \times \frac{12}{100} \times \frac{60}{365} \\ = \$5.91$$

■ The interest is \$5.91.

2. Find the interest on \$200 at 11% for 120 days.

$$I = \$200 \times \frac{11}{100} \times \frac{120}{365} = \frac{432}{73} \\ = \$7.23$$

■ The interest is \$7.23.

3. Find the interest on \$250 at 12% for 85 days.

$$I = \$250 \times \frac{12}{100} \times \frac{85}{365} = \frac{510}{73} \\ = \$6.98$$

■ The interest is \$6.98.

4. Find the interest on \$650 at 12% for 8 months.

$$I = \$650 \times \frac{12}{100} \times \frac{8}{12} \\ = \$52$$

■ The interest is \$52.

5. Find the interest on \$290 at 11% for 13 weeks.

$$\begin{aligned} I &= \$290 \times \frac{11}{100} \times \frac{13}{52} \\ &= \frac{319}{40} \\ &= \$7.98 \end{aligned}$$

- The interest is \$7.98.

6. Find the interest on \$550 at 13% for 4 years.

$$\begin{aligned} I &= \$550 \times \frac{13}{100} \times 4 \\ &= \frac{429}{2} \\ &= \$214.50 \end{aligned}$$

- The interest is \$214.50.

7. Find the interest on \$525 at 12% for 1 year and 6 months.

$$\begin{aligned} I &= \$525 \times \frac{12}{100} \times 1.5 \\ &= \$94.50 \end{aligned}$$

- The interest is \$94.50.

8. Find the interest on \$750 at 12.5% for 90 days.

$$\begin{aligned} I &= \$750 \times \frac{12.5}{1000} \times \frac{90}{365} \\ &= \frac{3375}{146} \\ &= \$23.12 \end{aligned}$$

- The interest is \$23.12.

Project: Various institutions have different rates of interest on loans. Visit a credit union, finance company, and bank and compare the rates of interest.

EXERCISES Find the simple interest.

PRINCIPAL	RATE	TIME
1. \$100	8% \$24.00	3 years
2. \$150	7% \$52.50	5 years
3. \$275	7% \$14.44	9 months
4. \$350	8% \$11.67	5 months
5. \$475	6% \$3.84	7 weeks
6. \$550	6% \$8.25	13 weeks
7. \$660	7% \$15.19	January 4, 1970 to May 4, 1970
8. \$695	8% \$23.61	March 12, 1971 to August 14, 1971
9. \$750	5% \$17.36	January 25, 1972 to July 13, 1972
10. \$835	6% \$19.22	September 3, 1972 to January 21, 1973
11. \$915	6½% \$21.18	October 10, 1973 to February 17, 1974
12. \$1000	7½% \$31.84	July 17, 1975 to December 19, 1975
13. \$1250	8½% \$64.04	March 5, 1976 to October 11, 1976
14. \$1325	7½% \$21.77	April 24, 1977 to July 13, 1977

Use the exact year to find the simple interest.

15. \$1500	6% \$35.75	May 15, 1978 to October 7, 1978
16. \$2000	7% \$72.49	February 1, 1980 to August 9, 1980

13 e / SIMPLE INTEREST SHORT CUTS

Many short cuts have been devised by people who have found it necessary to make rapid calculations of simple interest. Today's computer can calculate interest charges at any rate and for any length of time by simple programming. However, without computer service, people working in the business of consumer loan or retail credit granting want short cuts for quick quotations of interest.

The popular short cut is to "round off" time. For hasty calculation all months are considered to be 30 days, and the twelve-month year becomes 360 days. This allows for hasty calculations and the "estimating" of the interest is correct to within one cent on amounts up to \$100 for the one-month period.

The base for this short cut is to establish interest charges at 6%, and for the time of 60 days. Keep in mind that this is an estimate of interest.

Suppose we want to find the interest at 6% for 60 days on some amount. Using the formula,

$$I = P \times R \times T$$

$$I = P \times \frac{6}{100} \times \frac{60}{360}$$

$$I = P \times \frac{1}{100}$$

$$I = P \times 0.01$$

So, to find the interest at 6% for 60 days on any amount, just multiply the amount by 0.01. For example, the interest at 6% for 60 days on \$5357.50 is \$53.58.



When you multiply by 0.01, just move the decimal point 2 places to the left.

Fact and Figures

Estimate the cost of strikes in Canada.

What was the percentage increase or decrease over each preceding year for 1973 and 1974?

FACT AND FIGURES

Industrial disputes often result in "strikes". The Canadian average in the five years prior to 1973 was to lose 6 000 000 man-days to labour strikes. In 1972, we lost 7 800 000 man-days. In 1973, this was reduced to 5 700 000, but in 1974 the labour situation changed, and we lost over 8 500 000 man-days.

EXERCISES Find the simple interest on these principals at 6% for 60 days. Use the short cut described above—don't write out the multiplication.

- | | | | | | | | |
|---------------|---------|---------------|---------|---------------|---------|---------------|---------|
| 1. \$175.89 | \$1.76 | 2. \$246.80 | \$2.47 | 3. \$355.10 | \$3.55 | 4. \$478.32 | \$4.78 |
| 5. \$529.00 | \$5.29 | 6. \$666.67 | \$6.67 | 7. \$750.95 | \$7.51 | 8. \$899.99 | \$9.00 |
| 9. \$936.25 | \$9.36 | 10. \$1000.00 | \$10.00 | 11. \$1556.87 | \$15.57 | 12. \$2101.01 | \$21.01 |
| 13. \$2555.32 | \$25.55 | 14. \$3345.56 | \$33.46 | 15. \$5003.50 | \$50.04 | 16. \$7510.85 | \$75.11 |

13 f / SIMPLE INTEREST SHORT CUTS

The 6%-60 day short cut can be extended to other problems: to find interest at rates other than 6%, and to find interest at 6% for periods other than 60 days.

First, let's use it to find interest at rates other than 6%. The amount of interest will vary directly as the rate of interest varies. For instance, if the rate of interest for 60 days is 9%, the amount of interest at 9% will be $\frac{9}{6}$ or $1\frac{1}{2}$ times the amount of interest at 6%.

Simple interest is usually used only on short term loans. It is to the student's advantage to learn some of these short cuts so that he can intelligently compare interest rates on various short term loans.

EXAMPLE

Find the interest on \$1000 for 60 days at 5%.

The 6%-60 day interest is \$10.00. At 5%, the interest will be only $\frac{5}{6}$ as much.

$$\frac{5}{6} \times \$10.00 = \$8.33$$

■ The interest on \$1000 for 60 days at 5% is \$8.33.

EXAMPLE

Find the interest on \$1000 for 60 days at 7%.

The 6%-60 day interest is \$10.00. At 7%, the interest will be $\frac{7}{6}$ as much.

$$\frac{7}{6} \times \$10.00 = \$11.67$$

■ The interest on \$1000 for 60 days at 7% is \$11.67.

EXAMPLE

For the interest on \$1000 for 60 days at $4\frac{1}{2}\%$.

The 6%-60 day interest is \$10.00. The ratio of $4\frac{1}{2}\%$ to 6% is $\frac{4\frac{1}{2}}{6}$.

$$4\frac{1}{2} \div 6 = \frac{9}{2} \times \frac{1}{6} = \frac{9}{12} = \frac{3}{4}$$

At $4\frac{1}{2}\%$, the interest will be $\frac{3}{4}$ as much.

$$\frac{3}{4} \times \$10.00 = \$7.50$$

■ The interest on \$1000 for 60 days at $4\frac{1}{2}\%$ is \$7.50.

EXERCISES Find the amount of interest for 60 days for each principal and rate.

PRINCIPAL			RATE	PRINCIPAL			RATE
1.	\$1000	3%	\$5.00	2.	\$1200	4%	\$8.00
3.	\$1400	5%	\$11.67	4.	\$1600	7%	\$18.67
5.	\$1800	8%	\$24.00	6.	\$2000	9%	\$30.00
7.	\$2100	4½%	\$15.75	8.	\$2200	5½%	\$20.17
9.	\$2300	6½%	\$24.92	10.	\$2400	7½%	\$30.00
11.	\$2500	8½%	\$35.42	12.	\$2600	10½%	\$45.50

13 9 / SIMPLE INTEREST SHORT CUTS

Now, let's find interest for periods other than 60 days when the rate is 6%. Again, the time is directly proportional to the amount of interest. This means that if you increase the time by some rate, you increase the amount of interest by the same rate.

EXAMPLE

Find the interest on \$1000 at 6% for 90 days.

The 6%-60 day interest is \$10.00. The ratio of 90 days to 60 days is $\frac{90}{60}$ or $\frac{3}{2}$. At 90 days, the interest will be $\frac{3}{2}$ as much.

$$\frac{3}{2} \times \$10.00 = \$15.00$$

- The interest on \$1000 at 6% for 90 days is \$15.00.

EXAMPLE

Find the interest on \$1000 at 6% for 30 days.

The 6%-60 day interest is \$10.00. The ratio of 30 days to 60 days is $\frac{30}{60}$ or $\frac{1}{2}$. At 30 days, the interest will be $\frac{1}{2}$ as much.

$$\frac{1}{2} \times \$10.00 = \$5.00$$

- The interest on \$1000 at 6% for 30 days is \$5.00.

Project: Find out how a consumer loan company works. What do they do with their depositors' money? Where do they get most of their income?

DATE	WITHDRAWALS		DEPOSITS INTEREST		BALANCE	
					1632	50
2/4/75	500	00			1132	50
2/17/75			150	00	1282	50
3/17/75			150	00	① → 1432	50
3/31/75			17	91	1450	41
	②			③		

The amount of interest paid each period in a savings account is computed using simple interest.

① This is the amount on which the interest is computed.

② The interest is computed at three-month intervals—four times a year.

③ The amount of interest is found using the simple interest formula. The interest rate varies—for this account, 5% was used.

$$\begin{aligned}
 I &= P \times R \times T \\
 &= \$1432.50 \times 0.05 \times \frac{1}{4} \\
 &= \$71.625 \times \frac{1}{4} \\
 &= \$17.906
 \end{aligned}$$

EXERCISES Find the amount of interest on \$1500 at 6% for these time periods.

- | | | | | | | | |
|-------------|---------|--------------|---------|--------------|---------|--------------|---------|
| 1. 20 days | \$5.00 | 2. 45 days | \$11.25 | 3. 50 days | \$12.50 | 4. 60 days | \$15.00 |
| 5. 79 days | \$17.50 | 6. 75 days | \$18.75 | 7. 100 days | \$25.00 | 8. 120 days | \$30.00 |
| 9. 150 days | \$37.50 | 10. 180 days | \$45.00 | 11. 210 days | \$52.50 | 12. 240 days | \$60.00 |

13 h / SIMPLE INTEREST SHORT CUTS

We have used the 6%-60 day short cut for problems with a 6% rate where the time varies or for problems with a 60-day time period where the rate varies. We can also use the 6%-60 day short cut for any rate of interest and any period of time.

EXAMPLE

Find the interest on \$1000 at 8% for 75 days.

The 6%-60 day interest is \$10.00. The ratio of 8% to 6% is $\frac{8}{6}$ or $\frac{4}{3}$. At 8%, the interest is $\frac{4}{3}$ as much.

$$\frac{4}{3} \times \$10.00 = \$13.33.$$

The ratio of 75 days to 60 days is $\frac{75}{60}$ or $\frac{5}{4}$. At 75 days, the interest is $\frac{5}{4}$ as much.

$$\frac{5}{4} \times \$13.33 = \$16.66$$

- The interest on \$1000 at 8% for 75 days is \$16.66.

EXAMPLE

Find the interest on \$1500.00 at 3% for 180 days.

The 6%-60 day interest is \$15.00. The ratio of 3% to 6% is $\frac{3}{6}$ or $\frac{1}{2}$. The ratio of 180 days to 60 days is $\frac{180}{60}$ or $\frac{3}{1}$. At 3% and 180 days, the interest is $\frac{1}{2} \times \frac{3}{1}$ or $\frac{3}{2}$ as much.

$$\frac{3}{2} \times \$15.00 = \$22.50$$

- The interest on \$1500 at 3% for 180 days is \$22.50.

To compute the interest for any rate and any period of time, find

- (1) the 6%-60 day interest,
- (2) the ratio of the rate to 6%, and
- (3) the ratio of the time to 60 days.



EXERCISES Use the 6%-60 day short cut to find the interest on \$1500 for each rate and period of time.

RATE	TIME		RATE	TIME	
1. 4%	30 days	\$5.00	2. 4%	40 days	\$6.67
3. 5%	45 days	\$9.38	4. 5%	50 days	\$10.42
5. 6%	40 days	\$10.00	6. 6%	75 days	\$18.75
7. 7%	30 days	\$8.75	8. 7%	90 days	\$26.25
9. $4\frac{1}{2}\%$	80 days	\$15.00	10. $4\frac{1}{2}\%$	45 days	\$8.44
11. 9%	135 days	\$50.63	12. 9%	240 days	\$90.00
13. $7\frac{1}{2}\%$	75 days	\$23.44	14. $7\frac{1}{2}\%$	45 days	\$14.06
15. 8%	27 days	\$9.00	16. 8%	66 days	\$22.00

13 i / SIMPLE INTEREST TABLES

Auditors sometimes use tables to check simple interest computations. Table 13.2 is a simple interest table at 8% for \$100 from 1 to 60 days. Since the interest is given in seven decimal places, the table can be used for principal amounts up to one million dollars. Suppose, we want to use the table for a principal amount other than \$100. We just multiply the interest given for \$100 by the ratio of the principal amount to \$100. For instance, we can find the interest on \$155 by multiplying the interest given for \$100 by 1.55, which is the ratio of \$155 to \$100. Similarly, for \$78, multiply the interest given for \$100 by 0.78, the ratio of \$78 to \$100.

The table can also be used for periods over 60 days.



Interest is directly proportional to time.

For example, since the ratio of 120 days to 60 days is 2, the interest for 120 days is two times the interest for 60 days.

EXAMPLE

Use table 13.2 to find the interest on \$1000 at 8% for 48 days.

Interest on \$100 = \$1.0520547. The ratio of \$1000 to \$100 is $10\frac{1}{1}$ or 10.

$$10 \times \$1.0520547 = \$10.52$$

- The interest on \$1000 at 8% for 48 days is \$10.52.

EXAMPLE

Use table 13.2 to find the interest on \$100 at 8% for 250 days.

Interest on \$100 for 50 days = \$1.0958904. The ratio of 250 to 50 is $250/50$ or 5.

$$5 \times \$1.0958904 = \$5.479452 = \$5.48$$

- The interest on \$100 at 8% for 250 days is \$5.48.

EXAMPLE

Use table 13.2 to find the interest on \$100 at 8% for 83 days.

$$\text{Interest on \$100 for 60 days} \quad \$1.3150684$$

$$\text{Interest on \$100 for 23 days} \quad +0.5041095$$

$$\text{Interest on \$100 for 83 days} \quad \$1.8191779$$

- The interest on \$100 at 8% for 83 days is \$1.82.

INTEREST ON \$100 FOR 1 TO 60 DAYS AT 8%

Days	Interest	Days	Interest
1	0.0219178	31	0.6794520
2	0.0438356	32	0.7013698
3	0.0657534	33	0.7232876
4	0.0876712	34	0.7452054
5	0.1095890	35	0.7671232
6	0.1315068	36	0.7890410
7	0.1534246	37	0.8109589
8	0.1753424	38	0.8328767
9	0.1972602	39	0.8547945
10	0.2191780	40	0.8767123
11	0.2410958	41	0.8986301
12	0.2630136	42	0.9205479
13	0.2849315	43	0.9424657
14	0.3068493	44	0.9643835
15	0.3287671	45	0.9863013
16	0.3506849	46	1.0082191
17	0.3726027	47	1.0301369
18	0.3945205	48	1.0520547
19	0.4164383	49	1.0739726
20	0.4383561	50	1.0958904
21	0.4602739	51	1.1178082
22	0.4821917	52	1.1397260
23	0.5041095	53	1.1616438
24	0.5260273	54	1.1835616
25	0.5479452	55	1.2054794
26	0.5698630	56	1.2273972
27	0.5917808	57	1.2493150
28	0.6136986	58	1.2712328
29	0.6356164	59	1.2931506
30	0.6575342	60	1.3150684

table 13.2

EXERCISES Use table 13.2 to find the interest at 8% for the given principal and time.

PRINCIPAL	TIME		PRINCIPAL	TIME	
1. \$100	25 days	\$0.55	2. \$100	54 days	\$1.18
3. \$1000	58 days	\$12.71	4. \$1000	60 days	\$13.15
5. \$1000	75 days	\$16.44	6. \$1000	90 days	\$19.73
7. \$1000	120 days	\$26.30	8. \$1000	180 days	\$39.45
9. \$200	29 days	\$1.27	10. \$300	66 days	\$4.33
11. \$400	94 days	\$8.24	12. \$500	52 days	\$5.70
13. \$650	48 days	\$9.63	14. \$740	70 days	\$11.35
15. \$865	57 days	\$10.81	16. \$923	85 days	\$17.20

13 j / SIMPLE INTEREST TABLES

Table 13.3 is another kind of simple interest table. It shows the interest on \$1000 for 1 day at various rates. To find the amount of interest on \$1000 for 35 days, we simply multiply the amount for 1 day by 35. Also, the table can be used for principals other than \$1000. We just multiply the interest for \$1000 by the ratio of the principal amount to \$1000. We find the interest for \$148 by multiplying the interest given for \$1000 by 0.148, which is the ratio of \$148 to \$1000.

Work an example first with table 13.2, then with table 13.3 so students can compare the arithmetic and the answers for each.

EXAMPLE

Use table 13.3 to find the interest on \$1000 at $7\frac{1}{4}\%$ for 92 days.

Interest on \$1000 for 1 day = \$0.1986. Multiply by 92.

$$\$0.1986 \times 92 = \$18.2712$$

- The interest on \$1000 at $7\frac{1}{4}\%$ for 92 days is \$18.27.

EXAMPLE

Use table 13.3 to find the interest on \$120 at 6% for 1 day.

Interest on \$1000 for 1 day = \$0.1643. The ratio of \$120 to \$1000 is $\frac{120}{1000}$ or 0.12.

$$0.12 \times \$0.1643 = \$0.019716$$

- The interest on \$120 at 6% for 1 day is \$0.02.

Facts and Figures

Why does the Government of Canada need to borrow money? Is enough secured through the sale of bonds to Canadians? What other sources are available to the Government when financing is required?

FACTS AND FIGURES

In March, 1973, at the close of the fiscal year, Canada's gross public debt, owed mainly to Canadians, stood at \$52 billion. The public debt is made up in part of the amounts the government has borrowed in the financial markets, in part of amounts owing on Canada Savings Bonds held by the general public, and in part of pension and trust funds. Paying the interest and other charges on this debt is going to cost \$2.9 billion in 1974-75.

EXAMPLE

Use table 13.3 to find the interest on \$100 at 8% for 250 days.

Interest on \$1000 for 1 day = \$0.2222. Multiply by 250.

$$\$0.2191 \times 250 = \$54.7750$$

The ratio of \$100 to \$1000 is $\frac{100}{1000}$ or 0.1.

$$0.1 \times \$54.7750 = \$5.47750.$$

The interest on \$100 at 8% for 250 days is \$5.48.

INTEREST ON \$1000 FOR 1 DAY (365 DAY YEAR)

Interest Rate	Interest	Interest Rate	Interest
1%	0.0273	5½%	0.1506
1½%	0.0410	5¾%	0.1575
2%	0.0547	6%	0.1643
2½%	0.0684	6¼%	0.1712
3%	0.821	6½%	0.1780
3¼%	0.0890	6¾%	0.1849
3½%	0.0958	7%	0.1917
3¾%	0.1027	7¼%	0.1986
4%	0.1095	7½%	0.2054
4¼%	0.1164	8%	0.2191
4½%	0.1232	8¼%	0.2260
4¾%	0.1301	8½%	0.2328
5%	0.1369	10%	0.2739
5¼%	0.1438		

table 13.3

EXERCISES Use table 13.3 to find the interest for the given principal, rate, and time.

PRINCIPAL	RATE	TIME	PRINCIPAL	RATE	TIME
1. \$1000	3½%	25 days	2. \$1000	8%	64 days
3. \$1000	5¾%	38 days	4. \$1000	7¼%	49 days
5. \$100	6½%	11 days	6. \$100	3½%	120 days
7. \$200	2%	60 days	8. \$400	5¼%	54 days
9. \$600	6%	90 days	10. \$195	7½%	70 days
11. \$235	10%	180 days	12. \$765	8¼%	45 days
13. \$550	2½%	85 days	14. \$480	4¾%	36 days
15. \$1500	6¾%	75 days	16. \$1960	4½%	100 days

CHECKLIST

- Accurate year (p. 147)
- Exact year (p. 147)
- Interest (p. 144)
- Interest-bearing days (p. 148)
- Leap year (p. 148)
- Maturity date (p. 144)
- Principal (p. 144)
- Rate of interest (p. 144)
- Simple interest formula (p. 150)
- Simple interest table (p. 156)
- Time (p. 150)

PROBLEMS

- Adam deposited \$235 in his savings account at the bank. The rate of interest is 5%. How much interest will the deposit earn at the end of three months? **\$2.94**
 - What is the monthly simple interest on a promissory note for \$500 if the rate of interest is 8%? **\$3.33**
 - Agnes borrowed \$355 from Bernard for 7 months at a rate of 7%. How much interest did she pay? **\$14.50**
 - Calvin loaned Cecil \$50 for 9 weeks at 8% interest. How much interest did Cecil pay? **\$0.69**
 - The interest charge on past due accounts at the Tolman Store is 6%. Babette pays her bill of \$95 that is 65 days past due. How much interest does she owe for the late payment? **\$1.01**
 - Daniel borrowed \$250 on his life insurance policy. The company charges $6\frac{1}{2}\%$ interest on policy loans. How much per year will Daniel have to pay for the loan? **\$16.25**
 - Carol's father gave her a \$1000 bond for a graduation present. The bond pays interest semi-annually at a 6% rate. How much interest will she receive every six months? **\$30**
 - Dean borrowed \$125 from his mother on April 5 and promised to repay the loan on October 3 with interest at 5%. How much interest will he pay? **\$3.09**
 - Daphne loaned Edith \$25 from March 3 to September 25 with interest at 8%. How much interest did Edith pay Daphne? **\$1.12**
 - The Zero Bank charges 7% interest on secured loans. How much will it cost Earl to borrow \$550 for 135 days? **\$14.23**
 - The Tecon Credit Union charges 9% for personal loans to members of the credit union. How much will it cost Flora to borrow \$225 from January 10, 1976 to August 5, 1976? **\$11.48**
 - The Zenith Trust Company charges $8\frac{1}{2}\%$ on home loans. Interest is paid each month on the unpaid balance. The unpaid balance for the month on Geoffrey's home was \$15 368. How much of his monthly payment was for interest on the loan? **\$108.86**
 - Which is the more favourable loan to the borrower— $\frac{3}{4}\%$ per month on the unpaid balance or $8\frac{1}{2}\%$ simple interest per year? **$8\frac{1}{2}\%$ simple interest**
 - Hal has a \$1000 bond which pays him \$37 interest every six months. What is the rate of interest he receives on his bond? **7.4%**
- In problems 15 through 20, use table 13.2 for 8% interest.
- Find the interest on \$500 for 100 days. **\$11.11**
 - Find the interest on \$700 for 200 days. **\$31.11**
 - Find the interest on \$900 for 300 days. **\$60.00**
 - Find the interest on \$1000 for 243 days. **\$54.00**
 - Find the interest on \$345 for 75 days. **\$ 5.75**
 - Find the interest on \$345.50 for 120 days. **\$ 9.21**
- In problems 21 through 26, use table 13.3.
- Find the interest on \$800 at $1\frac{1}{2}\%$ for 95 days. **\$3.12**
 - Find the interest on \$1400 at $5\frac{3}{4}\%$ for 125 days. **\$27.56**
 - Find the interest on \$1200 at $4\frac{1}{2}\%$ for 240 days. **\$35.48**
 - Find the interest on \$700 at $6\frac{1}{4}\%$ for 43 days. **\$5.15**
 - Find the interest on \$645 at $3\frac{1}{2}\%$ for 59 days. **\$3.65**
 - Find the interest on \$1050 at 8% for 65 days. **\$14.95**

QUESTIONS

1. What is interest?
2. What factors determine the amount of interest?
3. When is interest paid?
4. How many days are there in an exact year?
5. How do you express months in terms of years?
6. What is the formula for simple interest?
7. What is the 6%-60 day rule for finding interest?
8. How can the 6%-60 day rule be used to find interest at rates other than 6%?
9. How do auditors use simple interest tables such as table 13.2 to verify interest computations?

DISCOUNT INTEREST AND DISCOUNTING NOTES

CHAPTER 14

Research/Discuss

- ☐ *Newsmagazines and financial pages in newspapers are sources of facts about variations in the interest rates. Rapid changes in a short term could be related to inflation.*
- ☐ *This question is designed to make students aware that having use of money (for investments or interest) is also financially desirable.*
- ☐ *When you discount a loan, it provides a higher effective rate of interest for the lender.*
- ☐ *Written evidence is better than oral testimony if there is a court action to collect the money. The written promise can also be discounted at a bank.*
- ☐ *Check provincial legislation, example, in Ontario "The Consumer Protection Act".*

RESEARCH/DISCUSS

- ☐ How have interest rates changed in the last several years? Has there been any change within the current year? Where can you find charts that show the variations?
- ☐ Which would be the most valuable to you: \$500 today or \$500 in a year?
- ☐ Why would a creditor prefer to discount a loan instead of charging simple interest?
- ☐ Why is it a good idea to have the promise to pay a debt in writing?
- ☐ Does your province have special legislation that protects lenders from unfair borrowing practices?

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ the meaning of discount interest
- ☐ how to find the proceeds from a discounted note
- ☐ the difference between nominal and effective rates of interest
- ☐ the different kinds of promissory notes
- ☐ how to obtain money immediately from a note not yet due
- ☐ how to compute the face of a note in order to receive an exact sum

\$ 5000.00 ← PRINCIPAL
 \$ 88.22 ← INTEREST (1)
 \$ 5088.22 ← TOTAL (4)

DUE Nov 14/75 D. _____
August 14 1975

three months (92 days) (3) AFTER DATE FOR VALUE RECEIVED I PROMISE

TO PAY TO Toronto - Dominion Bank OR ORDER

AT **THE TORONTO-DOMINION BANK** HERE, THE SUM OF

Five Thousand xx DOLLARS
 WITH INTEREST AT THE RATE OF 7 % PER ANNUM AS WELL AFTER AS BEFORE MATURITY xx

(2) James C. Morrison

FORM 329 (REV. 4-64)

When the Toronto-Dominion Bank approved James C. Morrison's application for a loan, after all terms had been fully discussed, the manager prepared a loan note. This note summarized the loan agreement, and by signing it Mr. Morrison agreed to repay the loan according to the conditions.

- ① The principal of the loan is \$5000.
- ② The annual interest rate is 7%. It is payable at maturity. That is, the interest is paid at the same time as the principal.
- ③ The length of time until the loan is due is the number of days between August 14 and November 14. This is 92 days.
- ④ Using the simple interest formula, $I = P \times R \times T$, the bank computes the amount of interest, and clearly states the full cost of borrowing the \$5000.

$$\begin{aligned}
 I &= \$5000 \times 0.07 \times \frac{92}{365} \\
 &= \$350 \times \frac{92}{365} \\
 &= \$3220/365 \\
 &= \$88.22
 \end{aligned}$$

Mr. Morrison may have been able to sell some stock to obtain the money he needed. Instead, he entered into an agreement giving the bank temporary ownership of the stock until the loan is repaid. If he does not repay the loan as agreed, the stock can be sold to satisfy the debt to the bank. There are other things Mr. Morrison could have used to secure the loan, such as his house or other real estate, or Canada Savings Bonds.

14 a / DISCOUNT INTEREST

Discount interest, like simple interest, is the price you pay for borrowing money. However, there is an important difference. Simple interest is paid when the loan is due, but discount interest is paid in advance. The discount interest is deducted from the principal amount at the time the loan is made. The difference is called the *proceeds* of the note. The proceeds are the amount of money actually received.

If you can compute simple interest, you can compute discount interest. There is no numerical difference between simple and discount interest.

EXAMPLE

Gerald borrows \$100. The rate of interest is 8%, but it is payable in advance by deducting it from the loan. Find the proceeds of the \$100 note that Gerald signs.

Find the amount of interest.

$$\$100 \times 0.08 = \$8$$

Subtract.

$$\$100.00 - \$8.00 = \$92.$$

- The proceeds of the note is \$92.

EXAMPLE

Genevieve borrows \$300 at $8\frac{1}{2}\%$ discount interest. Find the proceeds of the loan.

Find the amount of interest.

$$\$300 \times 0.085 = \$25.50$$

Subtract.

$$\$300.00 - \$25.50 = \$274.50$$

- The proceeds of the note are \$274.50.

Point out that discount interest is charged on the amount to be paid back rather than on the amount actually borrowed. In this example, the interest is charged on \$100 even though only \$92 is actually borrowed.

EXERCISES Find the proceeds of these one-year loans that are discounted.

LOAN	DISCOUNT RATE	LOAN	DISCOUNT RATE
1. \$175	7% \$162.75	2. \$220	8% \$202.40
3. \$245	$7\frac{1}{2}\%$ \$226.63	4. \$275	$8\frac{1}{2}\%$ \$251.63
5. \$560	9% \$509.60	6. \$585	8% \$538.20
7. \$400	$8\frac{1}{4}\%$ \$367.00	8. \$600	$7\frac{1}{4}\%$ \$556.50
9. \$1000	$8\frac{3}{4}\%$ \$912.50	10. \$1050	$7\frac{3}{4}\%$ \$968.63
11. \$1200	$8\frac{1}{2}\%$ \$1098.00	12. \$1250	$8\frac{3}{4}\%$ \$1140.63
13. \$1300	7.25% \$1205.75	14. \$1375	8.5% \$1258.13
15. \$1400	7.5% \$1295.00	16. \$1425	8.75% \$1300.31

14 b / NOMINAL AND EFFECTIVE INTEREST RATES

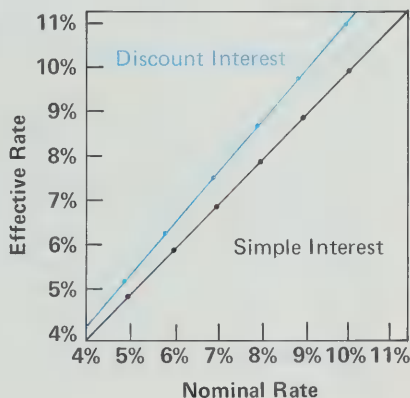
When interest is paid in advance, the true interest rate is actually higher. You have to consider that the principal of your loan has been reduced by the amount of the interest charge. For instance, if \$100 is discounted at 8%, the proceeds of the loan are only \$92 and the interest is \$8. What interest rate would you pay if the charge is \$8 interest on a loan of \$92? This true interest rate is found by dividing \$8 by \$92.

$$\$8 \div \$92 = 0.0869 = 8.7\%$$

So, you are actually paying 8.7% interest. The true interest rate is called the *effective rate*. The quoted rate is the *nominal rate*.

For all loans granted by chartered lending institutions the Consumer Protection Act requires that the total cost of borrowing be stated in the contract.

This graph compares the nominal and effective interest rates for simple interest and discount interest. For simple interest, the effective rate is the same as the nominal rate. However, for discount interest, the effective rate is higher.



EXAMPLE

Find the effective rate (true rate) of interest if \$100 is discounted at the nominal rate of 7%.

Find the amount of interest.

$$0.07 \times \$100 = \$7$$

Find the proceeds of the loan.

$$\$100 - \$7 = \$93$$

Divide to find the effective rate.

$$\frac{\$7}{\$93} = 0.0752 = 7.5\%$$

- The effective interest rate is 7.5%.

Project: Make a graph comparing the nominal and effective rates of interest when notes are discounted at 7%, 8%, and 9%.

EXERCISES Find the effective rate of interest to the nearest tenth of a percent when \$100 is discounted at these nominal rates.

- | | | | | | | | |
|---------|------|---------|-------|-----------|------|-----------|-------|
| 1. 4% | 4.2% | 2. 5% | 5.3% | 3. 6% | 6.4% | 4. 8% | 8.7% |
| 5. 9% | 9.9% | 6. 10% | 11.1% | 7. 4½% | 4.7% | 8. 5½% | 5.8% |
| 9. 6½% | 7.0% | 10. 7½% | 8.1% | 11. 8½% | 9.3% | 12. 9½% | 10.5% |
| 13. 7¼% | 7.8% | 14. 8¼% | 9.0% | 15. 7.75% | 8.4% | 16. 8.75% | 9.6% |

14 C / NON-INTEREST-BEARING NOTES

A *promissory note* (also called note receivable or note payable) is a written promise to pay a certain sum of money at a future date. A promissory note may or may not include interest. If it does include interest, it is referred to as an *interest-bearing note*; if it does not include interest, it is a *non-interest-bearing note*. Most promissory notes are interest-bearing notes. However, there are times when non-interest-bearing notes are used. If you were anxious to sell personal property, you might accept a non-interest-bearing note. If you were loaning money to a relative or a friend, you might not wish to make a profit.

If you held a non-interest-bearing note and didn't need money, you would probably hold the note until the maturity date. However, if you did need money, you could sell the note at a discount. The discount is the amount of interest the new owner charges you for buying the note from you.

Suppose, for example, you hold a \$500 non-interest-bearing note, and you need money. You sell it and have to pay \$30 discount interest. That means you receive \$470. The person to whom you sold the note now owns the \$500 note and will collect it when it is due.

To find the discount interest on a non-interest-bearing note, first find the number of days between the date the note is discounted and the maturity date. The days are counted the same way that days are counted to compute simple interest. Then use the simple interest formula to find the interest. The *proceeds* are the difference between the principal and the discount interest.

Point out that while a promissory note may not mention interest, if the note is discounted, there is an interest charge.

Discounting of notes should be discussed theoretically without inferring that it is a popular bank service.

Tom Taylor signed this non-interest-bearing promissory note in order to receive an \$800 loan from George Johnson.

① He signed the note on April 9, 1975.

② The amount written in figures must be the same as the amount written in words.

③ Compare the date the note was signed with the due date. Do they agree with the stated length of the loan?

\$ 800.00	PRINCIPAL	3	DUE	Oct 9/75	D.
\$	INTEREST	1	April 9	19	75
\$ 800.00	TOTAL				
SIX MONTHS	AFTER DATE FOR VALUE RECEIVED				PROMISE
TO PAY TO	George Johnson				OR ORDER
2	AT THE TORONTO-DOMINION BANK				HERE, THE SUM OF
eight hundred					XX XX DOLLARS
WITH INTEREST AT THE RATE OF % PER ANNUM AS WELL AFTER AS BEFORE MATURITY					
Tom Taylor					

FORM 329 (REV. 4-84)

EXAMPLE

Irving bought a car from Jason and gave him a \$500 non-interest-bearing note for the balance due. The note is due on December 15, 1975. Later, Jason needs money; so on April 3, 1975, he sells the note. The buyer is willing to discount the note at 8%. Find the proceeds of the note (the amount Jason will receive).

Find the number of discount days.

April 3 to December 15 is 256 days

Find the interest.

$$I = P \times R \times T$$

$$\begin{aligned} I &= \$500 \times \frac{8}{100} \times \frac{256}{365} \\ &= \$28.05 \end{aligned}$$

Subtract the discount interest from the principal.

$$\$500.00 - \$28.05 = \$471.95$$

- Jason will receive \$471.95.

EXAMPLE

Keith borrows \$350 from his brother-in-law Kevin to pay a dental bill. He gives Kevin a non-interest-bearing note due January 15, 1976. On October 7, 1975, Kevin arranges to have the note discounted at 9%. Find the proceeds of the note.

Find the number of discount days.

October 7 to January 15 is 100 days

Find the interest.

$$\begin{aligned} I &= \$350 \times \frac{9}{100} \times \frac{100}{365} \\ &= \$8.63 \end{aligned}$$

Subtract the discount interest from the principal.

$$\$350.00 - \$8.63 = \$341.37$$

- The proceeds of the note are \$341.37.

EXERCISES Find the proceeds of these non-interest-bearing notes.

	AMOUNT OF NOTE	MATURITY DATE	DISCOUNT DATE	DISCOUNT RATE	
1.	\$200	December 2, 1971	May 6, 1971	8%	\$190.79
2.	\$265	July 6, 1972	January 7, 1972	9%	\$253.24
3.	\$325	November 25, 1973	April 24, 1973	10%	\$305.86
4.	\$275	August 14, 1974	March 17, 1974	7%	\$267.09
5.	\$410	September 22, 1975	July 9, 1975	7%	\$404.10
6.	\$485	December 10, 1976	March 15, 1976	8%	\$456.30
7.	\$500	October 5, 1977	June 22, 1977	9%	\$487.05
8.	\$525	November 12, 1978	May 16, 1978	8%	\$504.29
9.	\$590	August 23, 1979	February 4, 1979	6½ %	\$568.99
10.	\$650	December 28, 1980	June 1, 1980	7½ %	\$621.95
11.	\$675	September 12, 1981	March 21, 1981	8½ %	\$647.49
12.	\$700	October 10, 1982	February 27, 1982	9½ %	\$659.01

14 d / INTEREST-BEARING NOTES

\$ 800.00 PRINCIPAL
 \$ _____ INTEREST
 \$ _____ TOTAL

(1) SIX MONTHS AFTER DATE FOR VALUE RECEIVED 1 PROMISE
 TO PAY TO THE TORONTO-DOMINION BANK OR ORDER
 AT THE TORONTO-DOMINION BANK HERE, THE SUM OF
EIGHT HUNDRED XX DOLLARS
 WITH INTEREST AT THE RATE OF 8.5 PER ANNUM AS WELL AFTER AS BEFORE MATURITY

(3) DUE October 9/75
April 9 19 75

(2) Amelia Westbrook
65 MAIN ST., GULLIVER, QUEBEC.

FORM 329 (REV. 4-64)

If George Johnson had charged interest on Tom Taylor's loan, he would sign this interest-bearing promissory note like the one signed above.

- ① The amount written in figures must be the same as the amount written in words.
- ② The amount of interest can be found using the simple interest formula, $I = P \times R \times T$. $I = \$800 \times 0.085 \times \frac{1}{2} = \34 . Each monthly interest payment will be $\$34 \div 6$ or $\$5.67$.
- ③ Compare the date signed and the due date. Does this agree with the stated length of the loan? When is the last interest payment due? What amount must Taylor pay on October 9, 1976?

Discounting interest-bearing notes is similar to discounting non-interest-bearing notes. However, before we find the discount on an interest-bearing note, we have to find the *maturity value* of the note. The maturity value is the sum of the interest and the principal.

EXAMPLE

A \$500 note bearing 6% interest for one year is to be discounted. Find the maturity value of the note.

Find the interest.

$$0.06 \times \$500 = \$30$$

Add the interest to the principal.

$$\$500 + \$30 = \$530$$

- The maturity value of the note is \$530.

After we know the maturity value, we can find the discount. The discount is calculated on the maturity value rather than on the principal.

FACTS AND FIGURES

18.9% of the 1969 male high-school graduates became white-collar workers and 70.0% became blue-collar workers.

13.3% of the male dropouts in 1969 became white-collar workers and 71.9% became blue-collar workers.

Of the 1969 female high-school graduates, 68.3% became white-collar workers and 13.5% became blue-collar workers.

Facts and Figures

Compare the differences in male high-school graduates and dropouts. What reasons can you give for the difference? Compare the differences of the figures for male and female graduates.

EXAMPLE

The maturity value of a \$1000 one-year note at 8% interest is \$1080. The discount rate is 9%. Find the discount interest if the note is discounted 3 months before the maturity date.

Find the discount interest for 3 months ($\frac{1}{4}$ year).

$$\begin{aligned} I &= \$1080 \times \frac{9}{100} \times \frac{1}{4} \\ &= \$24.30 \end{aligned}$$

■ The discount interest is \$24.30.

Compare borrowing \$500 for 60 days at 8% simple interest and at 8% discount interest. Point out the differences in the effective rates of interest, the amounts actually received, and the amounts to be paid at the maturity date.

EXERCISES Find the maturity values of these interest-bearing notes.

NOTE	RATE	TIME	NOTE	RATE	TIME
1. \$250	7%	1 year	2. \$395	8%	9 months
3. \$428	9%	6 months	4. \$477	8%	225 days
5. \$525	7%	135 days	6. \$615	8%	75 days
7. \$700	$8\frac{1}{2}\%$	3 months	8. \$756	$7\frac{1}{2}\%$	1 year
9. \$805	9%	3 years	10. \$872	$8\frac{1}{4}\%$	270 days
11. \$900	$8\frac{3}{4}\%$	100 days	12. \$950	8.33%	7 months

Find the discount on the maturity values of these interest-bearing notes.

MATURITY VALUE	DISCOUNT RATE	DISCOUNT PERIOD
13. \$386	7%	6 months
14. \$437	8%	90 days
15. \$483	9%	65 days
16. \$529	8%	7 months
17. \$630	7%	75 days
18. \$684	8%	100 days
19. \$715	$7\frac{1}{2}\%$	4 months
20. \$793	$8\frac{1}{2}\%$	120 days
21. \$836	$9\frac{1}{2}\%$	135 days
22. \$892	7.25%	68 days
23. \$942	8.5%	95 days
24. \$963	8.75%	7 months

14 e / INTEREST-BEARING NOTES

Now we can put all the steps together to discount an interest-bearing note:



- Find the maturity value of the note by adding the interest to the principal.
- Find the discount interest on the maturity value at the discount rate for the discount period.
- Subtract the discount from the maturity value.

The result is the proceeds of the note.

Discussion Question: What role do you think promissory notes play in the business world?

Consider: The difference between a promissory note and a loan; whether the note is negotiable; what negotiable means; whether promissory notes are a necessity.

EXAMPLE

Lambert borrows \$500 from Malcolm for one year with interest at 7%. He gives Malcolm a promissory note for the money. The note is due on October 16, 1976. On May 9, 1976, Malcolm discounts the note at an 8% discount rate. Find the proceeds of the note.

Find the maturity value of the note.

$$0.07 \times \$500 = \$35$$

$$\$500 + \$35 = \$535$$

Find the discount interest on the maturity value.

May 9 to October 16 is 160 days

$$I = \$535 \times \frac{8}{100} \times \frac{160}{365} \\ = \$18.76$$

Subtract the discount interest from the maturity value.

$$\$535.00 - \$18.76 = \$516.24$$

- The proceeds of the note are \$516.24.

EXERCISES INTEREST

NOTE	RATE	TIME	MATURITY DATE	DISCOUNT DATE	DISCOUNT RATE
1. \$200	7%	1 year	November 15	July 3	\$207.67 8%
2. \$285	8%	1 year	December 3	June 5	\$295.59 8%
3. \$300	9%	9 months	September 5	February 12	\$305.86 8%
4. \$350	7%	6 months	October 10	June 2	\$353.22 7%
5. \$400	8%	90 days	June 30	May 5	\$402.26 9%
6. \$440	8%	75 days	August 15	August 1	\$445.86 8%
7. \$500	7%	7 months	October 3	July 9	\$512.44 8%
8. \$567	8%	1 year	May 20	January 10	\$592.68 8½%
9. \$600	8½%	8 months	October 30	July 21	\$619.97 8%
10. \$660	9%	1 year	June 29	February 28	\$699.13 8½%
11. \$700	7%	10 months	December 17	April 24	\$699.94 8½%
12. \$775	8%	1 year	April 3	January 2	\$819.26 8½%

14 f / DISCOUNTING TO RECEIVE AN EXACT SUM

If you want to discount your own note at a bank, you have to make the note for a larger amount than you want. This is because the discount is deducted from the face amount. For example, if you sign a \$100 note and the discount rate is 8%, you would receive only \$92. How much should the note be for you to actually receive \$100? To find out, divide the amount you want (proceeds) by the complement of the discount rate.

The complement of a number less than one is the difference between that number and one. The complement of 0.09 is 0.91.



EXAMPLE

If a note is discounted at 8%, how large must it be to get \$100 proceeds?

Find the complement of the discount rate.

$$8\% = 0.08$$

$$1.00 - 0.08 = 0.92$$

Divide the proceeds by the complement.

$$\frac{\$100.00}{0.92} = \$108.695$$
$$= \$108.70$$

- A note for \$108.70, discounted at 8%, will give \$100 proceeds.

$$\text{Check: } \$108.70 \times 0.08 = \$8.6960 = \$8.70$$

$$\$108.70 - \$8.70 = \$100.00$$

EXERCISES How large are the non-interest-bearing notes that give these proceeds for the given discount rates?

PROCEEDS	DISCOUNT RATE	PROCEEDS	DISCOUNT RATE
1. \$214	8% \$232.61	2. \$279	7% \$300.00
3. \$301	9% \$330.77	4. \$333	8% \$361.96
5. \$388	7% \$417.20	6. \$469	8% \$509.78
7. \$536	7% \$576.34	8. \$589	8% \$640.22
9. \$600	8½% \$655.74	10. \$700	8¼% \$762.94
11. \$800	8.3% \$872.41	12. \$900	8.6% \$984.68
13. \$1000	8.8% \$1096.49	14. \$1000	9.25% \$1101.93
15. \$1000	9.5% \$1104.97	16. \$1000	9.8% \$1108.65

REVIEW / DISCOUNT INTEREST AND DISCOUNTING NOTES

CHECKLIST

Amount of note (p. 167)
Discount date (p. 167)
Discount interest (p. 164)
Discount period (p. 169)
Discount rate (p. 164)
Effective rate (p. 165)
Exact sum (p. 171)
Interest-bearing note (p. 166)
Loan (p. 164)
Maturity date (p. 167)
Maturity value (p. 168)
Nominal rate (p. 165)
Non-interest-bearing note (p. 165)
Note interest rate (p. 168)
Note receivable (p. 166)
Proceeds (p. 164)
Promissory note (p. 166)
Time (p. 167)
True interest rate (p. 165)

PROBLEMS

In problems 1 through 6, find the proceeds.

1. Neal borrows \$475 from his father and gives him a note. His father discounts the note at 8%. **\$437.00**
2. Nadine borrows \$575 at 9% discount interest. **\$523.25**
3. Olaf owes Oliver \$250 for an electric guitar. Olaf gives his promissory note in payment. On the day the note is dated, Oliver discounts it at 8%. **\$230.00**
4. Olga sells her car to Pamela and takes her note for \$500, due on July 14. On April 5, Olga sells the note at a discount of 9%. **\$489.04**
5. Patrick buys a motor boat from Randolph and gives his promissory note for \$300, due June 15. On May 1, Randolph discounts the note for 9½%. **\$296.49**
6. Scott gives a \$200 note due one year from November 25 to his church for his pledge. The church treasurer discounts the note on December 1 at 8%. **\$184.26**

In problems 7 through 12, find the effective rate of interest (true rate) to the nearest tenth of a percent.

7. A \$300 note is discounted at 7%. **7.5%**
8. A \$400 note is discounted at 8%. **8.7%**
9. A \$500 note is discounted at 9%. **9.9%**
10. A \$600 note is discounted at 10%. **11.1%**
11. A \$700 note is discounted at 8½%. **9.3%**
12. A \$900 note is discounted at 8¾%. **9.6%**

In problems 13 through 18, find the proceeds for these non-interest-bearing notes.

13. Terence holds a \$250 one-year note dated January 22. On September 1, he discounts it at 7%. (Note: The maturity date is the same date one year after the note is dated.) **\$243.14**
14. Vergil discounts a \$400 note due July 1 on January 26 at 8%. **\$386.32**
15. Dagmar sells a \$625 note due December 28 to her bank on July 29 at 9½%. **\$599.95**
16. Elise discounts a \$175 note due March 20, 1975 on October 5, 1974 at 8%. **\$168.63**
17. Frances discounts her own one-year note for \$330 at 8% with her employer. **\$303.60**
18. Waldo accepts Wallace's note for \$333 due February 29, 1976. On November 15, 1975, he discounts it at 8¾%. **\$324.54**

In problems 19 through 24, find the proceeds for these interest-bearing notes.

19. Albert accepted Barry's \$300 note with 6% interest due one year from March 25, 1976. On August 26, 1976, he discounted the note at 8%. **\$303.29**
20. Alice accepted Becky's \$400 note with 6% interest due one year from June 21, 1976. On August 2, 1976, she discounted the note at 7%. **\$397.74**
21. Alexander gave Benjamin a \$500 one-year note with 7% interest dated May 12, 1975. On September 3, 1975, he discounted it at 9%. **\$501.89**
22. Caspar gave Dennis a \$450 one-year note with 7% interest dated August 16, 1976. Dennis discounted the note on January 28, 1977 at 8%. **\$460.39**

23. Geraldine purchased a television set from the Three Dimension TV Company. For part of the payment, she gave a \$375 one-year note with 8% interest dated June 23, 1977. The Three Dimension TV Company discounted the note on July 1, 1977 at 9%. **\$369.35**
24. On July 15, 1978 at a discount of 10%, Carl purchased a \$1000 one-year note with 9% interest dated April 30, 1978. **\$1003.70**
3. How do you compute discount interest?
4. What is a nominal rate of interest with reference to discounting notes?
5. What is an effective rate of interest with respect to discounting notes?
6. Which is the better rate of interest—8% simple interest or 6% discount interest?
7. What are the proceeds of a note?
8. What is the maturity value of a note?
9. What information do you need to know to discount an interest-bearing note?
10. If a note is payable one year from date and it is dated March 16, 1975, what is the maturity date?

QUESTIONS

1. What is a promissory note?
2. What does it mean to discount a note?

Research/Discuss

- *If they didn't, the depositors would probably just withdraw the interest at the end of each period and reinvest the funds.*
- *With electronic computers, it is now possible to compound interest as frequently as desired. When the interest is compounded so frequently that the com-*

CHAPTER 15

pound period approaches zero, it is called "instant interest." Mathematically, "instant interest" produces an insignificant amount of interest more than daily compounding does. Be sure students investigate current advertising from local lending institutions.

- *This question and the next one help to emphasize the way compound interest grows. This may be a good time to look at interest tables (for \$1.00 at various rates) and discuss the significance of the entries.*
- *Nine years*
- *\$339.30*
- *\$500 due in three years is not the same as \$500 today. It is the amount of money that will grow to \$500 in three years at a given rate of compound interest.*

COMPOUND INTEREST

RESEARCH/DISCUSS

- Why do savings institutions pay compound interest instead of simple interest?
- How frequently can interest be compounded?
- Some savings associations are advertising "Instant Interest." What do they mean by it?
- If it takes 14 years for money to double itself at 5% compounded annually, how long do you think it would take to double at 8% compounded annually?
- If \$1.00 compounded annually at 6% will amount to \$18.42 in 50 years, how much do you think it would amount to in 100 years?
- How does a debt of \$500 due in three years differ from a debt of \$500 due now?

IN THIS CHAPTER YOU WILL LEARN . . .

- the difference between compound and simple interest
- how to compute compound interest for annual rates and for periods of less than one year
- that tables can be used to make these computations easily
- how to find the effective rate of compound interest
- how to compute the present value of money due at a later date

15 a / COMPOUND INTEREST

If you have a savings account, you receive interest on the amount of money in the account. This interest is usually computed several times a year. If you leave the interest in the account, it is added to the principal. Then, the next interest period, you will receive interest on it too. This process of adding interest to principal to earn more interest is called *compounding interest*. All savings accounts pay compound interest. For the first interest period of a savings account, the compound interest is computed the same as simple interest. The interest is compounded after the first simple interest period.

Project: Get pamphlets from several banks and savings associations that show various savings plans. What are the advantages and disadvantages of each plan?

If you have a savings account, you will usually receive a statement every three months. The statement shows the activity in the account and the amount of interest earned. ① This savings statement is for the period ending June 25, 1975.

② This amount was in the account at the beginning of the reporting period.

③ On April 28, \$750 was deposited in the account; on May 26, \$750 was withdrawn.

④ This interest was earned during the first quarter ending on March 31, 1975.

⑤ This interest was earned during the second quarter, the period just ended.

⑥ The next savings statement will have interest recorded here.

SAVINGS STATEMENT **ROYAL BANK**

INTEREST PERIOD		PERIOD ENDING	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT
31-03-75		32.59	28 04	750.00 D	26 05	750.00 W				
30-06-75		30.15								
THIRD QUARTER										
FOURTH QUARTER										
TOTAL FOR TAXES										
SAVINGS SUMMARY		TOTAL ITEMS	BEGINNING BALANCE		ENDING BALANCE					
		2	2 784.08		2 814.23					

FOR YOUR PROTECTION
Please examine this statement and report any discrepancy within 14 days. All items are credited subject to final payment.

CODES
D - DEPOSIT
W - WITHDRAWAL
RV - REVERSING ENTRY

AD - AUTOMATIC DEPOSIT
SV - SAVINGS TRANSFER
RE - REAL ESTATE PMT
BC - BANK CHARGE

PERIOD ENDING
25-06-75

DEPOSITOR'S RECORD, FOR DEPOSITORS USE ONLY

DATE	WITHDRAWALS	DEPOSITS INTEREST	BALANCE
31/3/75		32 59	2751 49
28/4/75		750 00	2784 08
26/5/75	750 00		3534 08
30/6/75		30 15	2784 08
			2814 23

DATE	DEPOSIT	WITHDRAWN	DEPOSITED
28/4/75	750 00		
26/5/75		750 00	

When you open a savings account, you receive an account passbook. Each time you make a deposit or withdrawal, the bank teller records it in the passbook. The passbook also has a section for you to keep a record of your current balance.

② These amounts are also recorded by the person who has the account.

③ This amount is the interest earned during the first quarter as reported on the first quarter statement.

④ This amount is the interest earned during the second quarter as reported on the statement above.

⑤ The current balance in the passbook is the same as the ending balance on the statement.

① The \$750 deposit on April 28 and the withdrawal on May 26 are recorded by bank tellers.

Point out that a savings account is one way of investing money.

Suppose you deposit a certain amount of money in a savings account and leave it there for several years, compounding interest. The sum of the principal (your original deposit) and the interest compounded over the years is the *compound amount*. The compound amount is the amount now in your savings account. You can find the compound interest (total interest earned) by subtracting your original principal from the compound amount.

EXAMPLE

Find the compound interest if the compound amount is \$367.35 and the principal is \$300.

Compound amount	\$367.35
Principal	<u>— 300.00</u>
Compound interest	\$ 67.35

Many savings associations advertise that their savings accounts are compounded daily. Discuss the effect this might have on the amount of interest received by the end of the year.



Can you find the compound interest for a savings account without knowing the compound amount? Suppose you know the principal, the rate of interest, and the time. For the first period, you can compute the interest in the same manner as simple interest.

The formula for computing simple interest is

$$I = P \times R \times T$$

where P is the principal, R is the rate of interest, and T is the period of time.

At the end of the first period, add the interest to the principal—the sum is the principal for the second period; find the interest for the second period using the simple interest formula; add the interest to the current principal—the sum is the principal for the third period; find the interest for the third period; and so on.

Facts and Figures

What do you think are the reasons for this increase in the number of telephone conversations?

FACTS AND FIGURES

In 1940, there was an average of 99 million daily telephone conversations on this continent. In 1969, there was an average of 462 million daily telephone conversations on this continent.

EXAMPLE

Find the compound amount and the compound interest on \$100 for 3 years compounded annually at 8%.

Find the simple interest for the first year.

$$\begin{aligned} I &= \$1.00 \times \frac{8}{100} \times 1 \\ &= \$8.00 \end{aligned}$$

Add the interest to the principal.

$$\$100 + \$8 = \$108$$

Find the simple interest for the second year.

$$\begin{aligned} I &= \$108 \times \frac{8}{100} \times 1 \\ &= \$8.64 \end{aligned}$$

Add the interest to the principal.

$$\$108.00 + \$8.64 = \$116.64$$

Find the simple interest for the third year.

$$\begin{aligned} I &= \$116.64 \times \frac{8}{100} \times 1 \\ &= \$9.33 \end{aligned}$$

Add the interest to the principal.

$$\$116.64 + \$9.33 = \$125.97$$

- The compound amount is \$125.97.

Subtract the original principal from the compound amount to find the compound interest.

$$\$125.97 - \$100.00 = \$25.97$$

- The compound interest is \$25.97.

Suppose the \$100 in the example above was invested for 3 years at a rate of 8%, but the interest was not compounded. What is the simple interest on \$100 for 3 years at 8%?

$$I = \$100 \times \frac{8}{100} \times 3 = \$24$$

So, the simple interest is only \$24. You can see the advantage of compounding interest.

Discuss the difference between interest that is compounded daily, interest that is compounded quarterly, and interest that is compounded semi-annually.

EXERCISES Find the compound amount and the compound interest. The interest is compounded annually.

PRINCIPAL	RATE	TIME		PRINCIPAL	RATE	TIME	
1. \$100	5%	2 years	\$110.25 \$10.25	2. \$100	6%	2 years	\$112.36 \$12.36
3. \$100	7%	2 years	\$114.49 \$14.49	4. \$100	8%	2 years	\$116.64 \$16.64
5. \$500	5%	3 years	\$578.81 \$78.81	6. \$500	6%	3 years	\$595.51 \$95.51
7. \$500	7%	3 years	\$612.52 \$12.52	8. \$500	8%	3 years	\$629.86 \$29.86
9. \$800	5½%	3 years	\$939.39 \$139.39	10. \$800	6½%	3 years	\$966.36 \$166.36
11. \$800	7½%	3 years	\$993.84 \$193.84	12. \$800	8½%	3 years	\$1021.83 \$221.83
13. \$1000	5¼%	3 years	\$1165.91 \$165.91	14. \$1000	6¾%	3 years	\$1216.48 \$216.48
15. \$1000	7.8%	3 years	\$1252.73 \$252.73	16. \$1000	8.3%	3 years	\$1270.24 \$270.24

15 b / COMPUTING COMPOUND INTEREST

Project: Find a “mathematics of finance” book. Does it have a compound interest table? What are the typical rates and periods listed?

Discuss how a computer might be programmed to calculate compound interest.

Show that the interest is less when the principal is compounded semi-annually or annually. For this example, if the principal is compounded semi-annually, the interest is \$8.16. If the principal is compounded annually, it is \$8.00, the same as simple interest.

Mention that many banks do not compute compound interest on amounts less than one dollar.

Interest is usually compounded more often than once a year. In this case, the annual rate of interest and the time must be adjusted. To find the rate of interest per compound period, divide the annual rate by the number of compound periods in one year. For example, if the annual rate is “8% compounded semi-annually” (twice a year), divide 8% by 2. The rate per compound period is 4%.

To find the number of compound periods, multiply the number of years by the number of compound periods in one year. For example, if the interest is to be compounded semi-annually for 5 years, multiply 5 by 2. There would be ten compound periods.

EXAMPLE

Find the compound amount and the compound interest if \$100 is compounded quarterly (four times a year) at 8% for one year.

Find the rate per compound period.

$$\frac{8\%}{4} = 2\%$$

Find the number of compound periods.

$$1 \times 4 = 4$$

Find the compound amount.

$$\begin{aligned}\text{First period: } I &= \$100 \times 0.02 \times 1 \\ &= \$2\end{aligned}$$

$$\$100 + \$2 = \$102$$

$$\begin{aligned}\text{Second period: } I &= \$102 \times 0.02 \times 1 \\ &= \$2.04\end{aligned}$$

$$\$102.00 + \$2.04 = \$104.04$$

$$\begin{aligned}\text{Third period: } I &= \$104.04 \times 0.02 \times 1 \\ &= \$2.08\end{aligned}$$

$$\$104.04 + \$2.08 = \$106.12$$

$$\begin{aligned}\text{Fourth period: } I &= \$106.12 \times 0.02 \times 1 \\ &= \$2.12\end{aligned}$$

$$\$106.12 + \$2.12 = \$108.24$$

■ The compound amount is \$108.24.

Subtract the original principal from the compound amount to find the compound interest.

$$\$108.24 - \$100.00 = \$8.24$$

■ The compound interest is \$8.24.

Where money grows on trees



10 ³ / ₄ %	on 5-year certificates \$500 minimum	②
9 ¹ / ₄ %	on 1-year certificates \$5,000 minimum	②
9 %	on 3-month certificates \$1000 minimum	②
4 ¹ / ₄ %	on Passbook Accounts non-chequing	①

Banks and Trust Companies usually offer several savings plans.

① A passbook account usually has the lowest rate of interest. No minimum deposit is required on this type of account and you can make deposits and withdrawals as often as you want. However, a service charge may be made if there are frequent withdrawals.

② Certificate savings usually pay higher interest rates. However, a minimum deposit is usually required. And you must keep your money on deposit for a specific length of time. This is the way a Savings and Loan makes a profit: you deposit \$1000 for one year at 8³/₄%. The Savings and Loan association loans the \$1000 to someone else for one year at 10¹/₂%.

EXERCISES Find the compound amount and the compound interest.

PRINCIPAL	RATE	TIME		
1. \$100	4% compounded semi-annually	1 year	\$104.04;	\$4.04
2. \$100	6% compounded semi-annually	1 year	\$106.09;	\$6.09
3. \$100	8% compounded semi-annually	1 year	\$108.16;	\$8.16
4. \$100	10% compounded semi-annually	1 year	\$110.25;	\$10.25
5. \$300	3% compounded semi-annually	1 year	\$309.07;	\$9.07
6. \$300	5% compounded semi-annually	1 year	\$315.19;	\$15.19
7. \$300	7% compounded semi-annually	1 year	\$321.37;	\$21.37
8. \$300	9% compounded semi-annually	1 year	\$327.61;	\$27.61
9. \$700	4% compounded semi-annually	1½ years	\$742.85;	\$42.85
10. \$700	6% compounded semi-annually	1½ years	\$764.91;	\$64.91
11. \$700	8% compounded semi-annually	1½ years	\$787.40;	\$87.40
12. \$700	10% compounded semi-annually	1½ years	\$810.34;	\$110.34
13. \$1000	4% compounded quarterly	1½ years	\$1061.52;	\$61.52
14. \$1000	8% compounded quarterly	1½ years	\$1126.16;	\$126.16
15. \$1000	10% compounded quarterly	1½ years	\$1159.69;	\$159.69
16. \$1000	9% compounded quarterly	1 year	\$1093.08;	\$93.08

15 C / COMPOUND INTEREST TABLES

Be sure students realize only a portion of the table is shown here.

Suppose the time in one of the problems above was extended to 10 or 20 years, with interest compounded quarterly. We would need an easier method for finding the compound amount and the compound interest. Compound interest tables have been calculated to aid in computing compound interest. Table I on page 388 shows the compound amount of \$1.00 at selected rates of interest and periods of time to six decimal places. A portion of this table is shown below.

Period	3½%	4%	5%	6%	7%	8%
1	1.035000	1.040000	1.050000	1.060000	1.070000	1.080000
2	1.071225	1.081600	1.102500	1.123600	1.144900	1.166400
3	1.108718	1.124864	1.157625	1.191016	1.225043	1.259712
4	1.147523	1.169859	1.215506	1.262477	1.310796	1.360489
5	1.187686	1.216653	1.276281	1.338226	1.402552	1.469328
6	1.229255	1.265319	1.340095	1.418520	1.500731	1.586874
7	1.272279	1.315932	1.407100	1.503631	1.605782	1.713824
8	1.316809	1.368569	1.477455	1.593849	1.718187	1.850930
9	1.362897	1.423312	1.551328	1.689480	1.838460	1.999004
10	1.410598	1.480244	1.628894	1.790849	1.967152	2.158924
11	1.459969	1.539454	1.710339	1.898300	2.104853	2.331638
12	1.511068	1.601032	1.795856	2.012198	2.252193	2.518169
13	1.563955	1.665073	1.885649	2.132930	2.409847	2.719623
14	1.618693	1.731676	1.979931	2.260906	2.578536	2.937193
15	1.675347	1.800943	2.078928	2.396560	2.759034	3.172168
16	1.733984	1.872981	2.182874	2.540354	2.952166	3.425941
17	1.794673	1.947900	2.292018	2.692775	3.158818	3.700016
18	1.857487	2.025816	2.406619	2.854342	3.379935	3.996017
19	1.922499	2.106849	2.526950	3.025603	3.616530	4.315698
20	1.989786	2.191123	2.653298	3.207139	3.869687	4.660954
21	2.059429	2.278768	2.785963	3.399567	4.140565	5.033830
22	2.131509	2.369919	2.925261	3.603541	4.430405	5.436536
23	2.206112	2.464716	3.071524	3.819753	4.740533	5.871459
24	2.283326	2.563305	3.225100	4.048938	5.072370	6.341176
25	2.363242	2.665237	3.386355	4.291874	5.427436	6.848470
26	2.445955	2.772470	3.555673	4.549386	5.807357	7.396348
27	2.531563	2.883369	3.733457	4.822349	6.213872	7.988056
28	2.620168	2.998704	3.920130	5.111690	6.648843	8.627100

If we know the compound amount of \$1.00 for a given rate and time, we can find the compound amount of *any* principal for that rate and time. We simply multiply the value in the table by the principal and round to two decimal places. In other words, the compound amount of \$10.00 is 10 times the compound amount of \$1.00; the compound amount of \$50.75 is 50.75 times the compound amount of \$1.00; the compound amount of \$100 is 100 times the compound amount of \$1.00; and so on.

Before using the table, first find the rate of interest per compound period and the number of compound periods. For instance, the compound amount of \$1.00 at 8% compounded quarterly for 10 years would be found in the 2% column opposite 40 periods. ($8\% \div 4 = 2\%$, $10 \times 4 = 40$)

EXAMPLE

Find the compound amount of \$1.00 at 8% compounded quarterly for 20 years.

Find the rate per compound period.

$$8\% \div 4 = 2\%$$

Find the number of compound periods.

$$20 \times 4 = 80$$

Find the compound amount under 2% opposite 80 periods.

$$(4.875450)$$

- The compound amount is \$4.88.

EXAMPLE

Find the compound amount and compound interest on \$100 at 7% interest compounded semi-annually for 5 years.

Find the rate per compound period.

$$7\% \div 2 = 3\frac{1}{2}\%$$

Find the number of compound periods.

$$5 \times 2 = 10$$

Find the compound amount for \$1.00 under 3½% and opposite 10 periods. (1.410598). Find the compound amount for \$100.

$$100 \times 1.410598 = 141.0598$$

- The compound amount is \$141.06.
- The compound interest is \$141.06 — \$100.00 = \$41.06.

Without a table, most students would be unable to find the compound amount. However, using the following formula and logarithms, it is quite easy.

Amount = Principal $\times (1+i)^n$ where i is the interest per period and n is the number of periods. Thus for the first example, the formula becomes

$$\begin{aligned} A &= \$1.00 \times (1 + 0.02)^{80} \\ &= \$1.00 \times (1.02)^{80} \end{aligned}$$

Using logarithms, this becomes

$$\begin{aligned} 80 \log (1.02) &= 80 \times 0.00860 \\ &= 0.6880 \end{aligned}$$

and the antilog of 0.6880 is 4.875, which agrees with the answer found by using the table. More advanced students may be interested in either the formula or the use of logarithms to shorten the arithmetic work.

EXERCISES Find the compound amount and the compound interest. Round your answers to the nearest cent.

PRINCIPAL	RATE	TIME	
1. \$1	5% compounded annually	12 years	\$1.80; \$0.80
2. \$1	6% compounded semi-annually	10 years	\$1.81; \$0.81
3. \$1	7% compounded semi-annually	15 years	\$2.81; \$1.81
4. \$1	8% compounded quarterly	10 years	\$2.21; \$1.21
5. \$100	5% compounded quarterly	5 years	\$128.20; \$28.20
6. \$100	6% compounded semi-annually	8 years	\$160.47; \$60.47
7. \$100	7% compounded quarterly	11 years	\$214.54; \$114.54
8. \$100	8% compounded quarterly	9 years	\$203.99; \$103.99
9. \$1000	5% compounded semi-annually	3 years	\$1159.69; \$159.69
10. \$1000	6% compounded semi-annually	5 years	\$1343.92; \$343.92
11. \$1000	7% compounded semi-annually	6 years	\$1511.07; \$511.07
12. \$1000	8% compounded quarterly	8 years	\$1884.54; \$884.54
13. \$1000	5% compounded semi-annually	25 years	\$3437.11; \$2437.11
14. \$1000	6% compounded semi-annually	20 years	\$3262.04; \$2262.04
15. \$1000	7% compounded semi-annually	11½ years	\$2206.11; \$1206.11
16. \$1000	8% compounded semi-annually	12½ years	\$2665.84; \$1665.84

Just as there are nominal and effective rates of interest for simple interest, there are nominal and effective rates of interest for compound interest.



- The nominal rate is the quoted rate.
- The effective rate is the true rate.

If the nominal rate is to be compounded more than once a year, the effective rate is greater. For example, if 6% is compounded quarterly, at the end of one year (4 periods) each \$1.00 of principal amounts to 1.061364. This means the effective rate is 0.061364 as compared to the nominal rate of 0.060000. If we are given a nominal rate, we can find the effective rate using Table I on page 388.

EXAMPLE

Find the effective rate of interest when the nominal rate of 8% is compounded quarterly.

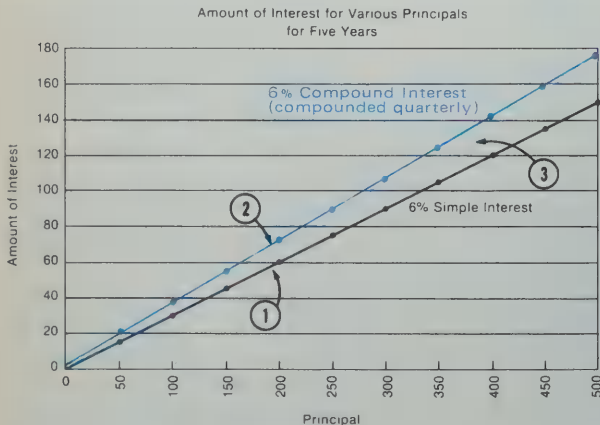
The compound amount of \$1.00 at 2% for 4 periods is 1.082432. Subtract to find the compound interest.

$$1.082432 - 1.00 = 0.082432$$

Change this to a percent and round to the nearest hundredth of a percent.

$$0.082432 = 8.24\%$$

- The effective rate is 8.24% when the nominal rate is 8% compounded quarterly.



Compound interest pays more than simple interest at the same rate, because at the end of each interest period, the interest is added to the principal. For simple interest, the principal remains the same.

① \$200 invested at 6% brings \$60 simple interest in five years.

② Invested at 6% compounded quarterly, \$200 would bring close to \$70 in five years.

③ Does \$400 bring twice as much interest as \$200?

EXAMPLE

Find the effective rate of interest when the nominal rate is 6% compounded semi-annually.

The compound amount of \$1.00 at 3% for two periods is 1.060900. Subtract to find the compound interest.

$1.060900 - 1.00 = 0.060900$

Change this to a percent and round to the nearest hundredth of a percent.

$0.060900 = 6.09\%$

- The effective rate is 6.09% when the nominal rate is 6% compounded semi-annually.

FACT AND FIGURES

In 1973, some \$18 000 000 000 was provided to borrowers other than financial businesses. Within this amount, \$6 200 000 000 was for mortgages.

By 1973, in Canada the amount outstanding in mortgages through our more popular mortgage institutions amounted to \$37 900 000 000. The mortgage lending in 1973 broke all former earlier records.

The great increase in mortgages in Canada in 1973 was the result of a buoyant residential construction program and large increases in the price of houses, apartments, and condominiums.

Facts and Figures

Have class establish the prevailing rate of interest on mortgages.

Apply this interest rate to the total amount of outstanding Canadian mortgages for a rough calculation of how much interest is paid by Canadians each year.

EXERCISES Find the effective rates of interest for these nominal rates. Round to the nearest hundredth of a percent.

NOMINAL RATE		COMPOUNDING PERIOD		NOMINAL RATE		COMPOUNDING PERIOD	
1.	5%	semi-annually	5.06%	2.	5%	quarterly	5.09%
3.	6%	semi-annually	6.09%	4.	6%	quarterly	6.14%
5.	7%	semi-annually	7.12%	6.	7%	quarterly	7.19%
7.	8%	semi-annually	8.16%	8.	8%	quarterly	8.24%
9.	10%	semi-annually	10.25%	10.	10%	quarterly	10.38%
11.	12%	semi-annually	12.36%	12.	12%	quarterly	12.55%

15 e / PRESENT VALUE (COMPOUND DISCOUNT)

Be sure students realize only a portion of the table is shown here.

Money has value in relation to time. A dollar today is worth more than a dollar without interest due a year from now. If the present interest rate is 8%, we say that money is worth 8%. If money is worth 8%, what is the *present value* (also called *compound discount* or *true discount*) of \$1.00 due in one year? In other words, how much money do you have to deposit at 8% interest to have a \$1.00 a year from now? You can use a present value table, such as Table II on page 392 to find out. A portion of the table is shown below.

Period	3½%	4%	5%	6%	7%	8%
1	0.966183	0.961538	0.952380	0.943396	0.934579	0.925925
2	0.933510	0.924556	0.907029	0.889996	0.873438	0.857338
3	0.901942	0.888996	0.863837	0.839619	0.816297	0.793832
4	0.871442	0.854804	0.822702	0.792093	0.762895	0.735029
5	0.841973	0.821927	0.783526	0.747258	0.712986	0.680583
6	0.813500	0.790314	0.746215	0.704960	0.666342	0.630169
7	0.785990	0.759917	0.710681	0.665057	0.622749	0.583490
8	0.759411	0.730690	0.676839	0.627412	0.582009	0.540268
9	0.733731	0.702586	0.644608	0.591898	0.543933	0.500248
10	0.708918	0.675564	0.613913	0.558394	0.508349	0.463193
11	0.684945	0.649580	0.584679	0.526787	0.475092	0.428882
12	0.661783	0.624597	0.556837	0.496969	0.444011	0.397113
13	0.639404	0.600574	0.530321	0.468839	0.414964	0.367697
14	0.617781	0.577475	0.505067	0.442300	0.387817	0.340461
15	0.596890	0.555264	0.481017	0.417265	0.362446	0.315241

EXAMPLE

Find the present value of \$1.00 due in one year (or one period) at 8% interest.

In the table, find the value in the 8% column opposite one period. (0.925925)

- The present value of \$1.00 due in one year at 8% interest is \$0.925925.

EXAMPLE

Find the present value of \$100 due in 4 years at 8% compounded quarterly.

Find the interest rate per compound period and the number of compound periods.

$$8\% \div 4 = 2\% \qquad 4 \times 4 = 16$$

Find the value in the 2% column opposite 16 periods. (0.728445)

The present value of \$1.00 is \$0.728445.

Multiply the present value of \$1.00 by 100 to find the present value of \$100.

$$100 \times 0.728445 = 72.8445$$

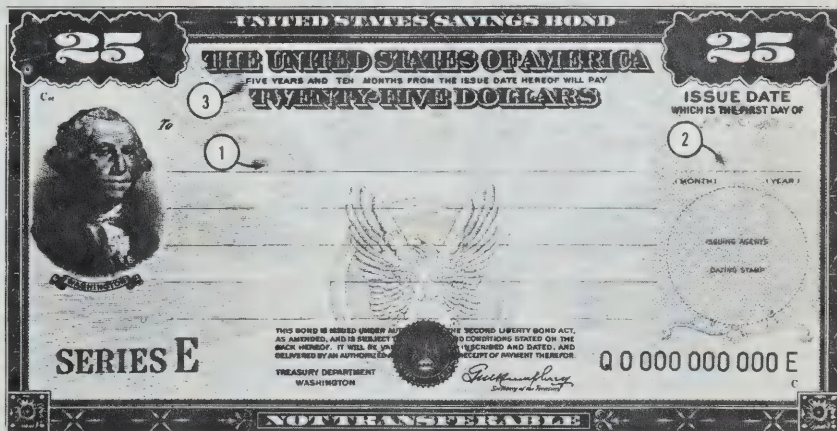
- The present value of \$100 due in 4 years at 8% interest compounded quarterly is \$72.84 (rounded to the nearest cent).

If you deposit \$72.84 in an account that pays 8% interest, and if the interest is compounded quarterly, then, in 4 years, you will have \$100 in the account.



Prior to the 1974 series, Canadians who invested in Canada Savings Bonds bought bonds at the full face value or principal amount, and received interest which was compounded in addition to the face value. These bonds and the 1974 issue are fully discussed in chapter 25. Citizens of the United States have one series of bonds which are quite different from ours. Their bonds are available from their government and at maturity they receive the full face value of the bond, but at the time of the purchase they have paid a reduced amount. The amount they had paid was the discounted value of the bond. The accumulation of interest brought the value up to the full face amount.

Series E Savings Bonds are issued by the U.S. government. The purchase or issue price of a \$100 bond is \$75. The common issue is a \$25 bond and it can be purchased at issue for \$18.75. At maturity, that bond may be cashed for \$25. The rate of earning is about 5.71% if a bond is held to maturity.



EXERCISES Find the present value.

PRINCIPAL	RATE	DUE	
1. \$1	5% compounded annually	1 year	\$0.952380
2. \$1	6% compounded annually	1 year	\$0.943396
3. \$1	7% compounded annually	2 years	\$34.38
4. \$1	8% compounded annually	3 years	\$0.793832
5. \$100	5% compounded semi-annually	4 years	\$82.07
6. \$100	6% compounded semi-annually	5 years	\$74.41
7. \$100	7% compounded semi-annually	6 years	\$66.18
8. \$1000	8% compounded semi-annually	8 years	\$533.91
9. \$1000	5% compounded quarterly	5 years	\$780.01
10. \$1000	6% compounded quarterly	7 years	\$659.10
11. \$1000	7% compounded quarterly	10 years	\$499.60
12. \$1000	8% compounded quarterly	12 years	\$386.54
13. \$1100	7% compounded semi-annually	20 years	\$277.83
14. \$1120	8% compounded quarterly	15 years	\$341.36
15. \$1200	7% compounded semi-annually	25 years	\$214.86
16. \$1250	8% compounded quarterly	12½ years	\$464.41

REVIEW / COMPOUND INTEREST

CHECKLIST

Annually (p. 177)
Compound amount (p. 176)
Compound discount (p. 184)
Compound interest (p. 175)
Compound interest table (p. 180)
Compound period (p. 178)
Effective rate (p. 182)
Nominal rate (p. 182)
Present value (p. 184)
Principal (p. 176)
Quarterly (p. 178)
Rate of interest (p. 176)
Semi-annually (p. 178)
Time (p. 176)
True discount (p. 184)

PROBLEMS

1. When Andrew is 6 years old, his father deposits \$1000 in a savings account that pays 6% interest compounded quarterly. The deposit is to help pay Andrew's college expenses. If Andrew enters college at 18, what will the compound amount be? **\$2043.48**
2. The credit union where Brian works pays 6% interest compounded quarterly on savings accounts. Brian has \$300 which he plans to deposit with the credit union. How much will Brian earn in interest on the \$300 if he leaves it on deposit for 5 years? **\$404.06**
3. Carlton has a life insurance policy with a loan value of \$1000. The interest on insurance policy loans is 5%. Carlton earns 6% interest compounded quarterly on his savings account. How much profit per year can Carlton make by borrowing the \$1000 from the insurance company and depositing it in his savings account? **\$11.36**
4. DeWitt lends Earl \$250 to buy a motorcycle. Earl gives DeWitt his promissory note due in one year with interest at 8% compounded quarterly. What will the maturity value of the note be? **\$270.61**
5. Amanda deposits \$200 with her credit union, which pays 6% interest compounded semi-annually. How much will she earn in interest if the funds remain on deposit for 5 years? **\$68.78**
6. Floyd borrowed \$300 from Garret for one year with interest at 7% compounded quarterly. How much will Floyd owe Garret when the loan is due? **\$321.56**
7. Belinda buys a fur coat for \$400. Instead of buying the coat, she could have invested the money at 6% interest compounded semi-annually for 10 years. How much money would she have had in 10 years? **\$722.44**
8. Morton left \$500 000 to his college when he died. If the college invests the funds at 6% interest compounded quarterly, how much income will it have each year? **\$30 681.50**
9. When Christopher is born, his father decides to deposit money in a savings account at 5% interest compounded annually. The money is to provide \$1000 for Christopher's college expenses when he is 18 years old. How much must his father deposit? **\$415.52**
10. Caroline plans to spend \$1000 on a cruise in 5 years. How much will she need to invest now at 6% interest compounded quarterly to have the \$1000 in 5 years? **\$742.47**
11. In 10 years, Cecilia's parents will celebrate their silver wedding anniversary. Cecilia wants to spend \$100 on a silver anniversary gift. How much must she deposit now at 6% interest compounded semi-annually to have the \$100? **\$55.37**
12. Jarvis will retire in 20 years. In addition to his retirement income, he would like to have a lump sum of \$10 000. How much must he invest now at 5% interest compounded semi-annually to produce the desired amount? **\$3724.30**
13. Timothy's father promised him \$1000 if he did not get a traffic ticket during the next four years. If money is worth 6% compounded quarterly, how much must his father invest now to have the \$1000 on hand if Timothy earns it? **\$788.03**
14. Eric owes Craig \$110 which is due in two years. If money is worth 6% compounded quarterly, how much should Eric pay Craig to settle the debt now? **\$97.65**

15. Wallace sells a piece of property to Sam. Sam agrees to pay \$3000 down and \$2000 at the end of each year for 2 years. If money is worth 8% compounded quarterly, what is the present value of the property. \$6554.67
16. Which is the better deal?
 - (a) To pay \$1000 down and \$1000 at the end of each year for 3 years. \$3673.02
 - (b) To pay \$2000 down and \$2000 at the end of 3 years. \$3679.24Compare the present values, using 6% interest compounded annually. (a) is the better deal

QUESTIONS

1. What does the expression, "Money has value in relation to time," mean?
2. What is the difference between compound interest and simple interest?
3. How would you use the compound interest tables to find the compound interest on \$100 in 5 years at 6% interest compounded quarterly?
4. What is the compound amount?
5. How would you find the effective rate of interest for a nominal rate of 6% compounded semi-annually?
6. What is another term for present value?
7. How would you use the present value tables to find the present value of \$100 due in 10 years if money is worth 7% interest compounded semi-annually?

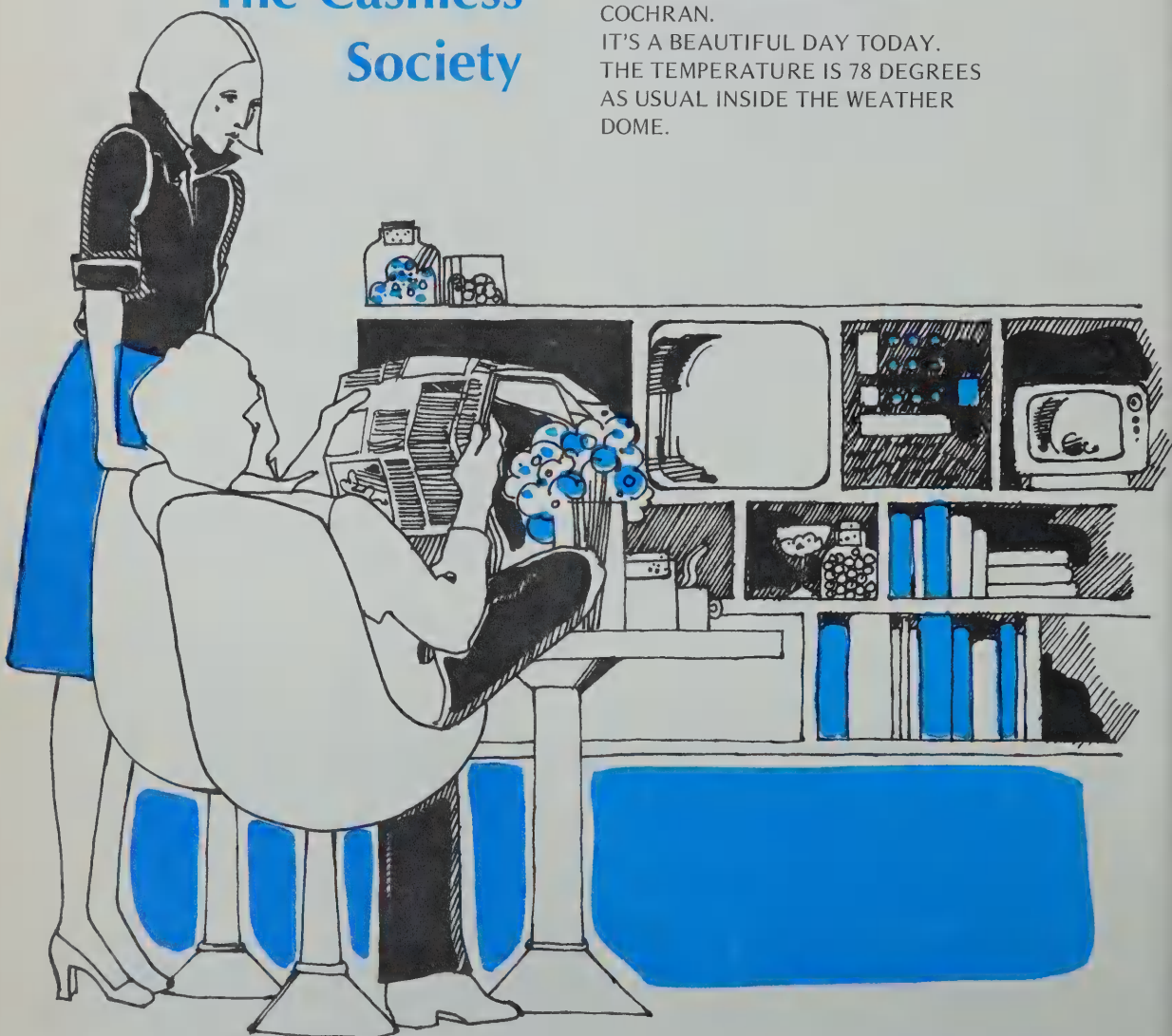
As Mr. Cochran sat down at the breakfast table, his wife punched the start button on their table-top computer. The Cochrans had just bought the newest model as a wedding anniversary present to each other.

"Watch, dear, it's starting!" Mrs. Cochran said.

The Cashless Society

GOOD MORNING MR. AND MRS. COCHRAN.

IT'S A BEAUTIFUL DAY TODAY.
THE TEMPERATURE IS 78 DEGREES
AS USUAL INSIDE THE WEATHER
DOME.



IT IS TUESDAY, JANUARY 14, 2012.
BY THE WAY, HAPPY ANNIVERSARY.
IF THERE IS ANYTHING YOU NEED
ME FOR TODAY, I AM READY TO
SERVE YOU.

"We'd better check our bank balance. Don't you think so, dear?" asked Mr. Cochran. He dialed a code number and their bank account number on the electronic dial.

YOUR BANK BALANCE IS \$569.
THAT INCLUDES THE AUTOMATIC
DEPOSIT OF YOUR SALARY PAY-
CHEQUE.
AUTOMATIC PAYMENT HAS BEEN
MADE OF ALL YOUR AUTHORIZED
BILLS, INCLUDING YOUR FIRST
PAYMENT ON ME.
THANK YOU.
THE YIELD ON YOUR STOCKS HAS
ALSO BEEN INSTANTLY CREDITED
TO YOUR ACCOUNT.

"Oh, Frank," Mrs. Cochran beamed. "This computer is so much better than the old way! Remember how advanced we used to think we were. At the end of every month, we received those dreary old computer printouts showing the balance on our account, together with all the charges and credits made during the month. Now we can just view them on this screen, whenever we want to."

"Yes," agreed Mr. Cochran. "And we had to make special arrangements in case our account was overdrawn. Then, the bank would automatically loan us the balance and, with interest added each month, we repaid the loan on the installment plan over a period of time."

"Right," said Mrs. Cochran, "and whenever I returned merchandise for a refund, I didn't receive cash. The credit was automatically transmitted to our account in the same way that the original charge was made."

They laughed together about the old days.

"I remember when I was a boy, my father's earnings were deposited to his credit at the bank by his employer.

When we went to the store to buy anything, we had to present some kind of card to pay for the goods or services."

"They were called *credit cards*, dear. I still have the first one the tooth fairy left me. I was just five years old! "

"That's right," he replied. "The salesperson had to place your card in a machine, enter the amount of the sale on a keyboard, and press a button. The information was instantly and electronically transmitted to the bank, where it was fed into a computer and subtracted from the balance of the account. How slow and bothersome it was."

"In a way, I miss the stores we used to go to. Buying everything from the televised computer catalogue is certainly efficient, but remember what fun the escalators were? I know what, Frank, let's take the children to Antique World next weekend. I hear they have built a perfect replica of a 1970-style shopping centre, complete with escalators and even authentic merchandise on the counters and racks! "

"Great idea! " said Mr. Cochran. "Well, I'd better see if any bills have arrived." He dialed another code number.

DR. THOMAS, YOUR DENTIST, 15
DOLLARS
MISS PEGGY STEPPER, DANCING
TEACHER, 20 DOLLARS
MR. MICHAELS, YOUR LAWYER, 30
DOLLARS
IF YOU WISH TO PAY, SIMPLY
PUSH THE GREEN BUTTON.

Mr. Cochran had just finished as Mrs. Cochran came in with a letter. "It's from your mother," she said. "Probably an anniversary note."

As she opened the envelope a green piece of paper fluttered to the floor. "She says that she's enclosing a ten-dollar bill for our anniversary."

Mr. Cochran picked it up, and they looked at it together.

"What a strange gift," said Mr. Cochran. "I wonder what you do with it."

Research/Discuss

- *Discuss the importance of the various advantages and disadvantages. Have students decide what kinds of items they would be willing to purchase with installments and what kinds they would not. Advantages: enjoy the use of the item while paying for it, determine the condition of the product before it is paid for in the event that an adjustment becomes necessary, make budgeting easier. Disadvantages: increase the cost of the pro-*

CHAPTER 16

duct, item may wear out before it is paid for, encourage some people to overbuy and perhaps get into unexpected financial trouble.

- *Legislation of both federal and provincial governments should be discussed dealing with maximum interest charges and "truth in lending" practices that insure full declaration of all credit charges to the consumer.*
- *Discuss inflation in terms of prices and the value of money. Students should understand that as inflation continues, a dollar is worth less and less. That is, what you bought for \$10 yesterday may cost \$12 next month. People who owe money on installment contracts pay off their debts with dollars that are worth less.*
- *The last two questions are designed to bring concepts of this chapter into personal context for each student.*

INSTALLMENT FINANCING

RESEARCH/DISCUSS

- What are some advantages of buying with installment contracts instead of cash? Are there any disadvantages?
- Do we have legislation in Canada designed to protect consumers from paying excessively high interest charges?
- How do rising prices (inflation) help people who are in debt with installment contracts?
- Could you afford to pay \$100—today—for some necessity of life? Would you rather pay a little extra for the same item, but pay at a rate of \$5 a week?
- Suppose you have \$100 that you don't plan to spend soon. Would you loan it to a friend if he agrees to pay you back \$5 a week for 20 weeks?

IN THIS CHAPTER YOU WILL LEARN . . .

- about additional ways an individual can borrow money
- how installment purchases are made
- that interest rates mean different things in different kinds of contracts
- that personal loans are like buying cash
- how credit unions help their members get loans

Consumer Credit Balances Outstanding, 1966 to 1973

(In millions of dollars, as at end of each year, quoting alternate years)

	1966	1968	1970	1972	1973
Total	7778	9856	11 706	14 844	17 600
Chartered Banks	2458	3673	4663	7144	8878
Sales Finance and Consumer Loan Companies	2347	2638	2851	2646	2823
Department Stores	610	644	705	823	961
Other Credit Card Issuers	88	131	186	233	249
Credit Unions	937	1247	1493	2000	2420
All Other Sources	1338	1523	1808	1998	2269

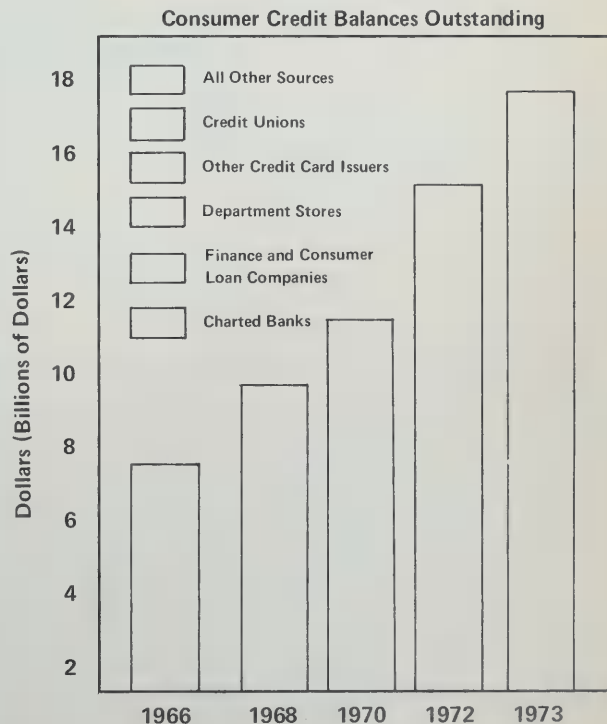
Source: *Statistics Canada*

How much money do Canadians owe on installment financing?

① Canadian department stores offer their own Credit Plans to customers, e.g., Eaton, Simpson.

② “Other Credit Card Issuers” have made a dramatic increase in Canadian consumer credit. Think of the number of stores in your district using Charge-x or Master Charge.

③ Chartered banks continue to carry the largest share of our credit owed by consumers.



16 a / FINANCE CHARGES

Tell students that they need to know how installment contracts are computed if they want to protect themselves against errors and overcharges.

Before you purchase with an installment contract, you should know some terms. The price of merchandise before any finance charge is added is called the *cash selling price*. After the finance charge is added to the cash selling price, the sum is called the *time selling price*.

$$\text{Eq. 1} \quad \text{Cash selling price} + \text{Finance charge} = \text{Time selling price}$$

When the down payment and any trade-in allowance are deducted from the *cash selling price*, the result is the *cash unpaid balance*. When the down payment and any trade-in allowance are deducted from the *time selling price*, the result is the *contract unpaid balance*.

$$\text{Eq. 2} \quad \text{Cash selling price} - (\text{Down payment} + \text{Trade-in}) = \text{Cash unpaid balance}$$

$$\text{Eq. 3} \quad \text{Time selling price} - (\text{Down payment} + \text{Trade-in}) = \text{Contract unpaid balance}$$

The cash unpaid balance is the amount on which the finance charge is calculated. The contract unpaid balance is the sum of the cash unpaid balance and the finance charge.

$$\text{Eq. 4} \quad \text{Cash unpaid balance} + \text{Finance charge} = \text{Contract unpaid balance}$$

The contract unpaid balance can also be found if you know the amount of each monthly payment and the number of months you have to pay.

$$\text{Eq. 5} \quad \text{Monthly payment} \times \text{Number of months} = \text{Contract unpaid balance}$$

There are several relations involved in these equations and students must be thoroughly familiar with the terms in order to understand them. Use advertisements collected by the students to point out the terms and relations.

Project: Bring in advertisements from newspapers and magazines showing what can be purchased on the installment plan.

If you know the cash selling price and the time selling price, you can find the finance charge. Just use Eq. 1.

$$\text{Time selling price} - \text{Cash selling price} = \text{Finance charge}$$

For example, in the stereo ad on page 193, the finance charge is \$30.

Time selling price	\$410.00
Cash selling price	— 380.00
Finance charge	\$ 30.00

This means that if you buy the stereo set on the installment plan, you must pay \$30 extra.



Time selling price = Contract unpaid balance + Down payment + Trade-in

EXAMPLE

The Gulliver Appliance Company has a washing machine on sale for \$275.50, with a down payment of \$50. The monthly payments are \$11.65 for 24 months. Find the finance charge.

Find the contract unpaid balance. (Eq. 5)

$$\$11.65 \times 24 = \$279.60$$

Find the time selling price. (Eq. 3)

$$\$279.60 + \$50.00 = \$329.60$$

Subtract to find the finance charge.

$$\$329.60 - \$275.50 = \$54.10$$

- The finance charge is \$54.10.

Discussion Question: What financing information do advertisements include? Is it sufficient for you to determine the finance charge?

Consider: Length of time; number of payments; cash selling price; down payment; trade-in allowance.

EXERCISES Find the finance charges.

DOWN PAYMENT	MONTHLY PAYMENT	MONTHS	CASH SELLING PRICE	DOWN PAYMENT	MONTHLY PAYMENT	MONTHS	CASH SELLING PRICE
1. \$10	\$2.15	6	\$50.45	2. \$15	\$2.70	9	\$105.00
3. \$25	\$11.70	12	\$125.50	4. \$30	\$13.05	12	\$145.95
5. \$20	\$26.75	15	\$195.00	6. \$30	\$34.75	18	\$220.25
7. \$48	\$36.25	18	\$248.45	8. \$40	\$32.50	12	\$298.50
9. \$70	\$33.85	12	\$349.95	10. \$100	\$53.30	18	\$395.00
11. \$110	\$56.95	18	\$424.75	12. \$100	\$89.10	24	\$476.50
13. \$120	\$97.60	24	\$525.20	14. \$150	\$96.30	24	\$550.50

Point out that most bank credit cards and oil company credit cards operate on this system.

The finance charge for an installment purchase is usually expressed as a percent of the cash unpaid balance. This percent, called a *flat rate*, is based on the number of months payments are made and the rate per month. The rate per month varies from $\frac{1}{2}\%$ to 3% —it depends on provincial laws, competitors' rates, and the customer's credit rating. Below are flat rates for selected monthly rates and numbers of months. For example, if the monthly rate is $1\frac{1}{2}\%$ and the payments last 12 months, then the flat rate is 18% and the finance charge is 18% of the cash unpaid balance.

MONTHLY RATES	MONTHS						
	6	9	12	15	18	24	30
	$\frac{1}{2}\%$	3%	$4\frac{1}{2}\%$	6%	$7\frac{1}{2}\%$	9%	15%
	$\frac{3}{4}\%$	$4\frac{1}{2}\%$	$6\frac{3}{4}\%$	9%	$11\frac{1}{4}\%$	$13\frac{1}{2}\%$	$22\frac{1}{2}\%$
	1%	6%	9%	12%	15%	18%	30%
	$1\frac{1}{2}\%$	9%	$13\frac{1}{2}\%$	18%	$22\frac{1}{2}\%$	27%	45%
	2%	12%	18%	24%	30%	36%	60%
	$2\frac{1}{2}\%$	15%	$22\frac{1}{2}\%$	30%	$37\frac{1}{2}\%$	45%	75%
	3%	18%	27%	36%	45%	54%	90%



$$\text{Monthly rate} \times \text{Number of months} = \text{Flat rate}$$

There are two ways to compute the finance charge.

- (1) If the finance charge is computed using a simple interest rate, the charge *decreases* each month because the balance decreases. The charge is calculated each month only on the remaining balance.
- (2) If the finance charge is computed using a flat rate, the charge each month stays the same. The charge is calculated on the original balance and divided equally over the number of months.

So, a flat rate is not the same as a simple interest rate, it is much higher.

EXAMPLE

Harold buys a television set that has a cash selling price of \$350. He makes a down payment of \$70 and takes 24 months to pay the balance. If the rate per month is 1% , how much is the finance charge? What is the monthly finance charge?

Mention again your Canadian legislation, particularly provincial that makes certain that the consumer does know his full interest charge.

Find the cash unpaid balance.

Cash selling price	\$350.00
Down payment	— 70.00
Cash unpaid balance	\$280.00

Find the flat rate.

1% for 24 months is 24%

Multiply the cash unpaid balance by the flat rate.

24% of \$280 = $0.24 \times \$280 = \67.20

- The finance charge is \$67.20.

Divide the finance charge by the number of months.

$\$67.20 \div 24 = \2.80

- The monthly finance charge is \$2.80.

EXAMPLE

Carol buys a tape recorder that has a cash selling price of \$150. She makes a down payment of \$30 and takes 12 months to pay the balance. If the rate per month is $\frac{3}{4}\%$, how much is the finance charge? What is the monthly finance charge?

Find the cash unpaid balance.

Cash selling price	\$150.00
Down payment	— 30.00
Cash unpaid balance	\$120.00

Find the flat rate.

$\frac{3}{4}\%$ for 12 months is 9%

Multiply the cash unpaid balance by the flat rate.

9% of \$120 = $0.09 \times \$120 = \10.80

- The finance charge is \$10.80.

Divide the finance charge by the number of months.

$\$10.80 \div 12 = \0.90

- The monthly finance charge is \$0.90.

Project: Visit a number of automobile dealers and find out how many different answers you get to the question: "What is your rate of interest to finance an automobile purchase?"

EXERCISES Find these finance charges.

	CASH SELLING PRICE	DOWN PAYMENT		MONTHS	RATE PER MONTH		CASH SELLING PRICE	DOWN PAYMENT		MONTHS	RATE PER MONTH
1.	\$52	\$13	\$7.02	9	2%	2.	\$76	\$26	\$9.00	9	2%
3.	\$105	\$30	\$4.50	12	$\frac{1}{2}\%$	4.	\$145	\$45	\$12.00	12	1%
5.	\$195	\$50	\$10.88	15	$\frac{1}{2}\%$	6.	\$220	\$55	\$24.75	15	1%
7.	\$259	\$60	\$26.87	18	$\frac{3}{4}\%$	8.	\$295	\$75	\$39.60	18	1%
9.	\$325	\$90	\$74.03	21	$1\frac{1}{2}\%$	10.	\$385	\$100	\$59.85	21	1%
11.	\$415	\$125	\$104.40	24	$1\frac{1}{2}\%$	12.	\$480	\$130	\$105.00	24	$1\frac{1}{4}\%$
13.	\$525	\$150	\$101.25	27	1%	14.	\$630	\$150	\$194.40	27	$1\frac{1}{2}\%$
15.	\$725	\$175	\$247.50	30	$1\frac{1}{2}\%$	16.	\$855	\$200	\$245.63	30	$1\frac{1}{4}\%$

16 C / MONTHLY PAYMENTS

After you know the cash unpaid balance and the finance charge, you can compute the monthly payment.

$$\text{Monthly payment} = \frac{\text{Cash unpaid balance} + \text{Finance charge}}{\text{Number of months}}$$



$$\left(\begin{array}{c} \text{Cash unpaid} \\ \text{balance} \end{array} \right) + \left(\begin{array}{c} \text{Finance} \\ \text{charge} \end{array} \right) = \left(\begin{array}{c} \text{Contract} \\ \text{unpaid balance} \end{array} \right)$$

EXAMPLE

Find the amount of the monthly payment if the cash unpaid balance is \$75 and the finance charge for 12 months is \$9.

Find the contract unpaid balance.

$$\$75 + \$9 = \$84$$

Divide the contract unpaid balance by the number of months.

$$\$84 \div 12 = \$7$$

- The monthly payment is \$7.

EXAMPLE

Find the amount of the monthly payment if the cash unpaid balance is \$125 and the finance charge is \$33.75 for 18 months.

Find the contract unpaid balance.

$$\$125.00 + \$33.75 = \$158.75$$

Divide the contract unpaid balance by the number of months.

$$\$158.75 \div 18 = \$8.82$$

- The monthly payment is \$8.82.

EXERCISES Find each monthly payment.

CASH UNPAID BALANCE			FINANCE CHARGE			MONTHS			CASH UNPAID BALANCE			FINANCE CHARGE			MONTHS		
1.	\$42		\$2.52			6		\$7.42	2.	\$78		\$7.02			6		\$14.17
3.	\$95		\$8.55			9		\$11.51	4.	\$120		\$16.20			9		\$15.13
5.	\$145		\$17.40			12		\$13.53	6.	\$180		\$32.40			12		\$17.70
7.	\$200		\$30.00			15		\$15.33	8.	\$250		\$56.25			15		\$20.42
9.	\$310		\$55.80			18		\$20.32	10.	\$360		\$81.00			18		\$24.50
11.	\$415		\$87.15			21		\$23.91	12.	\$455		\$143.33			21		\$28.49
13.	\$575		\$138.00			24		\$29.71	14.	\$645		\$232.20			24		\$36.55
15.	\$710		\$191.70			27		\$33.40	16.	\$855		\$284.29			27		\$42.20

AGREEMENT				ORIGINAL	
SELLER'S IDEALER NAME CONWAY FURNITURE		CITY OR TOWN BRANDON		PROVINCE MANITOBA	
ADDRESS 196 REEBER		COUNTY		TELEPHONE NO.	
BUYER'S NAME William Aiken		ADDRESS 136 KRAMTON ST.		BRANDON	
WIFE'S NAME JEAN		HOW LONG MARRIED 5 YEARS		PREVIOUS ADDRESS WILORVT. SASK.	
M ☐ F ☐ W ☐ 424-1947		M ☐ F ☐ W ☐ 473-2201		M ☐ F ☐ W ☐ 47	
EMPLOYER C.N.R.		POSITION FOREMAN - YARD		HOW LONG EMPLOYED 10 YEARS	
PREVIOUS EMPLOYER CLAF (PERMANENT CRAFT)		POSITION CLERK		HOW LONG EMPLOYED 16 YEARS	
MORTGAGE PAYMENT 27,600		MORTGAGE BALANCE 18,600		MORTGAGE PAYMENT 2,000	
MORTGAGE BALANCE 2,35		MORTGAGE PAYMENT 2,35		MORTGAGE PAYMENT 2,35	
NAME BROTHER C.G. AIKEN		ADDRESS WILORVT. SASK.		HOW LONG EMPLOYED 10 YEARS	
THIS COMPANIES WITH WHICH APPLICANT HAS DEALT - IF FINANCE CO. GIVE BRANCH		STARTING BAL.		NOW OWES	
1 EGTON'S		476 -		-	
2 H.F.C.		400		210 -	
NAME OF BANK TORONTO DOMINION		BRANCH BRANDON (NORTH)		PAY 1 AMT 30 -	
NAME OF BANK		BRANCH		PAY 1 AMT	
THE UNDERSIGNED BUYER (WHICH MEANS ALL BUYERS JOINTLY AND SEVERALLY) HEREBY PURCHASES FROM SELLER AND AGREES TO PAY SELLER FOR THE FOLLOWING MATERIALS AND LABOUR IN ACCORDANCE WITH THE SPECIFICATIONS CONTAINED HEREIN OR ATTACHED HERETO ON THE TERMS AND CONDITIONS SET FORTH HEREUNDER AND ON THE REVERSE SIDE HERETO WHICH ARE INCORPORATED HEREIN BY REFERENCE					
DESCRIPTION OF MATERIALS LABOUR AND CONTRACT SPECIFICATIONS					
IF SPACE IS INSUFFICIENT COMPLETE A SUPPLEMENTARY SHEET WITH COPIES FOR AND INITIALED BY ALL PARTIES					
1 CHESTFIELD SUITE, 3 PIECE (SOFA & 2 CHAIRS)				367.87	
2 END TABLES				41.49	
1 CUCKTAIL TABLE				56.49	
SAID TOTAL DEFERRED BALANCE IS PAYABLE IN <u>12</u> EQUAL CONSECUTIVE INSTALMENTS OF \$ <u>39.60</u> EACH ON THE <u>2nd</u> FRIDAY OF EACH <u>MONTH</u> PERIOD COMMENCING ON THE <u>2nd</u> FRIDAY OF <u>MAY</u> <u>1976</u> AND ENDING ON THE <u>2nd</u> FRIDAY OF <u>APRIL</u> <u>1977</u> AND ONE FINAL PAYMENT OF \$ <u>-</u> ON THE <u>-</u> FRIDAY OF <u>-</u> <u>19</u>, TOTALLING \$ <u>475.20</u> IN THE EVENT DEFAULT IS MADE IN PAYMENT OF ANY ONE OF THE SAID INSTALMENTS THE WHOLE AMOUNT REMAINING UNPAID SHALL FORTHWITH BECOME DUE AND PAYABLE WITHOUT DEMAND OR NOTICE WITH INTEREST ON THE AMOUNT OVERDUE AND UNPAID AT THE ANNUAL RATE OF THE COST OF BORROWING AS STIPULATED HEREIN.					
CASH SELLING PRICE \$ <u>507.34</u> ADD PROVINCIAL SALES TAX \$ <u>25.37</u> ADD \$ <u>-</u> SETTLEMENT AND \$ <u>-</u> DELIVERY TOTAL CASH SELLING PRICE \$ <u>532.71</u> LESS DOWN PAYMENT \$ <u>130.00</u> BALANCE OF TOTAL CASH PRICE \$ <u>402.71</u> ADD NET BALANCE PRIOR ACCOUNT \$ <u>-</u> UNPAID BALANCE TO BE FINANCED (TOTAL PRESENT DEBT) \$ <u>-</u> ADD COST OF BORROWING (FINANCE CHARGE) \$ <u>72.49</u> COST OF BORROWING AS ANNUAL RATE <u>18</u> % TOTAL DEFERRED BALANCE (NOTE AMOUNT) \$ <u>475.20</u> AGGREGATE OF COST TO BUYER (1 PLUS 2) \$ <u>605.20</u> TOTAL AMOUNT TO ACQUIRE MATERIALS AND PAY PRIOR ACCOUNT (3 PLUS 4) \$ <u>-</u>					
BUYER(S) ACKNOWLEDGE(S) HAVING RECEIVED A TRUE COPY OF THIS AGREEMENT WHICH WAS COMPLETELY FILLED IN AT THE TIME OF SIGNING					
DATED AT <u>Brandon</u> <u>MANITOBA</u> THIS <u>10</u> DAY OF <u>April</u> <u>76</u> SELLER'S CORPORATE OR TRADE NAME BUYER(S) SIGN BELOW IN INK <u>W. Aiken</u>					
SIGNATURE OF AUTHORIZED OFFICIAL DUE DATE SELECTOR 1ST FR ☐ 2ND FR ☒ 3RD FR ☐ 4TH FR ☐ 15-20TH ☐ 22-28TH ☐					

When Mr. and Mrs. Aiken decided to purchase some new furniture on installments from Conway Furniture, they had to sign this contract.

- ① Sales tax is 5% of the total purchase.
- ② Mr. Aiken could choose any amount as his down payment. Approximately what percent of the total cash price is \$130?
- ③ The annual rate for financing the installment purchase must be stated on the contract.

Since Mr. Aiken is making 12 monthly payments (at 1½% per month), the service charge is equal to 18% of the unpaid cash balance.

- ④ The buyer can choose the number of installments or the size of the payments. Does $12 \times \$39.60 = \475.20 ?
- ⑤ The Aggregate of Cost to Buyer price shows the amount actually paid—the total cash price plus the service charge.

16 d / SIMPLE INTEREST RATE

Remember that the flat rate is higher than the simple interest rate. This is, a flat rate of 5% results in a larger finance charge than a simple interest rate of 5%. The finance charge for installment buying is usually figured using a flat rate. To make comparisons, it is good to be able to express the flat rate as a simple interest rate.

Notice that payments of \$5 a month repay only the cash unpaid balance. The total monthly payment, including the finance charge would be \$5.50.

Suppose the cash unpaid balance on a purchase is \$20. And, for a finance charge of \$2, it can be repaid in 4 months by paying \$5 a month. On the \$5 paid at the end of the first month, the buyer pays 1 month's interest. On the \$5 paid at the end of the second month, he has to pay 2 month's interest. On the \$5 paid at the end of the third month, he has to pay 3 month's interest. And on the \$5 paid at the end of the fourth month, he has to pay 4 month's interest. That is, he is actually paying:

$$\begin{array}{r} \text{interest on \$5 for 1 month} \\ + \text{interest on \$5 for 2 months} \\ + \text{interest on \$5 for 3 months} \\ + \text{interest on \$5 for 4 months} \\ \hline \text{or interest on \$5 for 10 months} \end{array}$$

This interest amounts to \$2 (the finance charge). We can now use the simple interest formula to find the simple interest rate.

$$\text{Since } I = P \times R \times T, R = \frac{I}{P \times T}$$



$$I = \$2; P = \$5; T = 10/12 \text{ (Change months to years.)}$$

Therefore,

$$\begin{aligned} R &= \frac{\$2}{\$5 \times 10/12} \\ &= \frac{12}{25} \\ &= 0.48 \\ &= 48\% \end{aligned}$$

The simple interest rate is 48%.

EXAMPLE

A short wave radio sells for \$95 cash. It can be purchased on the installment plan for \$25 down and 6 monthly payments of \$13.10 each. Find the rate of simple interest to finance the radio.

Find the finance charge.

$$\begin{aligned}\text{Time selling price} &= (6 \times \$13.10) + \$25.00 \\ &= \$103.60 \\ \text{Time selling price} &\$103.60 \\ \text{Cash selling price} &\underline{- 95.00} \\ \text{Finance charge} &\$ 8.60\end{aligned}$$

Find the amount of the cash unpaid balance to be paid each month.

$$\begin{aligned}\text{Cash selling price} &\$95.00 \\ \text{Down payment} &\underline{- 25.00} \\ \text{Cash unpaid balance} &\$70.00 \\ \$70.00 \div 6 &= \$11.67\end{aligned}$$

Find the number of months that interest is actually being paid.

$$1 + 2 + 3 + 4 + 5 + 6 = 21$$

Use the simple interest formula.

$$I = \$8.60$$

$$P = \$11.67$$

$$T = 2\frac{1}{12} = \frac{7}{4}$$

$$\begin{aligned}R &= \frac{I}{P \times T} = \frac{\$8.60}{\$11.67 \times \frac{7}{4}} \\ &= \frac{34.4}{81.7} = 0.421 = 42.1\%\end{aligned}$$

- The simple interest rate is 42.1%.

To find the sum of consecutive numbers, add the smallest and largest numbers, multiply the sum by the number of terms, and divide the product by two.

$$1 + 2 + 3 + 4 + 5 + 6 = \frac{(1 + 6) \times 6}{2} = \frac{42}{2} = 21$$



EXERCISES Find the rate of simple interest to the nearest tenth of a percent for these installment contracts.

	CASH SELLING PRICE	DOWN PAYMENT	NUMBER OF MONTHLY PAYMENTS	AMOUNT EACH PAYMENT	
1.	\$95	\$20	6	\$14.00	41.1%
2.	\$133	\$33	6	\$18.20	31.5%
3.	\$159	\$39	8	\$17.40	42.7%
4.	\$185	\$35	8	\$21.00	32.0%
5.	\$200	\$40	10	\$18.80	38.2%
6.	\$225	\$50	10	\$20.10	32.4%
7.	\$263	\$73	12	\$17.75	22.4%
8.	\$295	\$55	12	\$23.00	27.7%

16 e / SIMPLE INTEREST RATE

We can also find the simple interest rate for monthly contracts by using this formula:

$$i = \frac{24 \times I}{P \times (n + 1)}$$

where i = rate of simple interest

I = finance charge

P = cash unpaid balance

n = number of monthly payments



This formula is used *only* when payments are made by the month.

The generalized formula is

$$i = \frac{2 \times m \times I}{P \times (n + 1)}$$

where i is the rate of simple interest, m is the number of payments in one year, I is the finance charge, P is the cash unpaid balance, and n is the number of payments. If the payments are monthly, then m is 12 and we have the formula given in the text. In the generalized formula, interest can also be found on weekly payments using $m = 52$.

EXAMPLE

Suppose that the cash unpaid balance is \$500, the finance charge is \$58, and there are 12 monthly payments. Find the simple interest rate.

I = finance charge = \$58

P = cash unpaid balance = \$500

n = number of monthly payments = 12

$$\begin{aligned} i &= \frac{24 \times I}{P \times (n + 1)} = \frac{24 \times 58}{500 \times (12 + 1)} \\ &= \frac{348}{1628} \\ &= 0.214 \\ &= 21.4\% \end{aligned}$$

Do the operation inside the parentheses first!

■ The simple interest rate is 21.4%.

EXAMPLE

A home freezer sells for \$395. The appliance store will finance it with a down payment of \$75 and 18 monthly installments of \$21.31 each. Find the rate of simple interest to finance this freezer.

Find the finance charge.

$$\begin{aligned} \text{Time selling price} &= (18 \times \$21.31) + \$75.00 \\ &= \$458.58 \end{aligned}$$

$$\begin{array}{r} \text{Time selling price} \quad \$458.58 \\ \text{Cash selling price} \quad - 395.00 \\ \hline \text{Finance charge} \quad \$ 63.58 \end{array}$$

Find the cash unpaid balance.

$$\begin{array}{r} \text{Cash selling price} \quad \$395.00 \\ \text{Down payment} \quad - 75.00 \\ \hline \text{Cash unpaid balance} \quad \$320.00 \end{array}$$

Use the formula.

$$I = \text{finance charge} = \$63.58$$

$$P = \text{cash unpaid balance} = \$320$$

$$n = \text{number of monthly payments} = 18$$

$$i = \frac{24 \times I}{P \times (n + 1)} = \frac{24 \times 63.58}{320 \times (18 + 1)}$$

$$= \frac{95.37}{380}$$

$$= 0.2509$$

$$= 25.1\%$$

- The simple interest rate is 25.1%.

FACTS AND FIGURES

In 1954, there were 5 243 000 persons employed in Canada. 468 000 were in the Atlantic Region, 925 000 in the Prairie Region, 437 000 in British Columbia, 1 470 000 in Quebec, and 1 945 000 in Ontario.

By 1973, the Canadian total employment was 8 759 000. Distributions of people to match the above paragraph would read: 676 000, Atlantic; 1 426 000 Prairie; 937 000, British Columbia; 2 353 000, Quebec; and 3 366 000, Ontario.

The population had greatly increased. Were there any changes in the concentration of that population to specific areas?

Facts and Figures

Acknowledge the heavy concentration in both Ontario and Quebec.

Note that British Columbia more than doubled its employment statistics.

EXERCISES Find the simple interest rate to the nearest tenth of a percent.

CASH SELLING PRICE	DOWN PAYMENT	NUMBER OF MONTHLY PAYMENTS	AMOUNT OF EACH PAYMENT	
1. \$60	\$10	3	\$17.70	37.2%
2. \$85	\$15	5	\$15.40	40.0%
3. \$100	\$20	6	\$14.55	31.3%
4. \$148	\$28	9	\$15.15	32.7%
5. \$184	\$34	9	\$19.65	43.0%
6. \$200	\$40	12	\$14.50	16.2%
7. \$225	\$50	12	\$15.90	16.7%
8. \$250	\$60	12	\$18.70	33.4%
9. \$295	\$95	15	\$14.85	17.1%
10. \$310	\$100	15	\$16.10	22.5%
11. \$475	\$125	15	\$27.70	28.1%
12. \$500	\$100	17	\$26.60	17.4%
13. \$625	\$125	17	\$34.40	22.6%
14. \$700	\$200	18	\$34.05	28.5%
15. \$735	\$225	21	\$28.20	17.6%
16. \$750	\$250	24	\$25.85	23.1%

Small loan companies charge interest on personal loans using the same formulas and methods as are used for installment buying. Think of it this way—obtaining a loan is like buying a sum of money with no down payment. Consider the amount you borrow as the cash selling price (or cash unpaid balance, since there is no down payment). The sum of the repayments is the time selling price. Then,

$$\text{Sum of repayments} - \text{Amount borrowed} = \text{Finance charge}$$

In general, small loans are expensive loans due to record keeping, collection expenses, and losses through bad debts. Interest charges are established by legislation. In Canada, The Small Loans Act establishes the maximum rates for consumer loans below \$1500. These rates are on a sliding scale, therefore, the smaller the loan, the higher the rate. The following chart compares our Canadian rates with selected American states. The rates are shown as per month.

NEW YORK	
\$0—\$99	2½%
\$100—\$299	2%
\$300—\$900	1½%

CANADA	
\$0—\$300	2%
\$301—\$1000	1%
\$1001—\$1500	½%

FLORIDA	
\$0—\$299	3%
\$300—\$599	2%

HAWAII	
\$0—\$99	3½%
\$100—\$300	2½%

LOANS

FURNITURE • AUTOMOBILE • SALARY

Amount of Loan	Monthly Repayments		
	24 Months	15 Months	9 Months
\$190.00	\$10.50	\$15.23	\$23.72
275.00	15.04	21.89	34.19
350.00	19.03	27.76	43.40
500.00	27.00	39.47	61.82
750.00	39.52	58.27	91.77

THE LIBERTY LOAN COMPANY
"The friendly loan company."

Offices in
principal cities

This ad is typical of those placed by loan companies in newspapers and magazines. Analyze the finance charges according to the formula shown above.

① The sum of the repayments is \$252, so the finance charge is \$62. This is an annual rate of about 31%.

② The sum of the repayments is \$213.48, so the finance charge is \$23.48. This is an annual rate of almost 30%. Thus the annual rate is nearly the same even though there are 15 fewer payments.

Would the Liberty Loan Company be a good place to get a loan? Why might a person be forced to go to a small loan company for a loan?

The rates in these charts are *monthly* rates. This means that in Hawaii, a loan under \$100 has a legal rate of 42% simple interest per year.

To find the annual rate, multiply the monthly rate by 12.



EXAMPLE

The Liberty Loan Company will loan \$190, to be repaid in 24 monthly payments of \$10.50. Find the rate of simple interest.

Find the finance charge.

$$\begin{aligned}\text{Sum of payments} &= 24 \times \$10.50 \\ &= \$252\end{aligned}$$

$$\begin{array}{r} \text{Sum of payments} \quad \$252.00 \\ \text{Amount borrowed} \quad - 190.00 \\ \hline \text{Finance charge} \quad \$ 62.00 \end{array}$$

Use the formula.

$$I = \text{finance charge} = \$62$$

$$P = \text{cash unpaid balance} = \$190$$

$$n = \text{number of monthly payments} = 24$$

$$\begin{aligned}i &= \frac{24 \times I}{P \times (n + 1)} = \frac{24 \times 62}{190 \times (24 + 1)} \\ &= \frac{744}{2375} \\ &= 0.313 \\ &= 31.3\%\end{aligned}$$

Have students find out how much money would be in a savings account at the end of 24 months if \$10.50 were paid in every month at 5% interest compounded quarterly. (= \$315)

- The simple interest rate is 31.3%.

EXERCISES Find the rates of interest for these loans advertised by the Liberty Loan Company.

AMOUNT OF LOAN	MONTHS	MONTHLY REPAYMENT	AMOUNT OF LOAN	MONTHS	MONTHLY REPAYMENT
1. \$275	24	\$15.04 30.0%	2. \$350	24	\$19.03 29.3%
3. \$500	24	\$27.00 28.4%	4. \$750	24	\$39.52 25.4%
5. \$190	15	\$15.23 30.4%	6. \$275	15	\$21.89 29.1%
7. \$350	15	\$27.76 28.5%	8. \$500	15	\$39.47 27.6%
9. \$750	15	\$58.27 24.8%	10. \$190	9	\$23.72 29.7%
11. \$275	9	\$34.19 28.5%	12. \$350	9	\$43.40 27.8%
13. \$500	9	\$61.82 27.1%	14. \$750	9	\$91.77 24.3%

Most school teachers organizations have credit unions. Find out how much it costs to join the organization and what the interest rates are on personal loans through the credit union.

Discussion Question: Suppose you want to make a \$700 purchase and can repay the amount in 90 days. Where could you get the money? Which source would be the best one to use?

Consider: Various sources such as friends and relatives, life insurance policies, banks, savings and loan associations, credit unions, installment contracts, personal loan companies, loan sharks; interest rates; simple or discount interest; ease in obtaining money; favourable and unfavourable aspects of each source.

The interest rate for borrowing money from a credit union is normally lower than that from a small loan company. Of course, you must be a member of the credit union before you can borrow money from it. Usually you must be an employee of a company or organization to be a member of its credit union. Most credit unions have a membership fee of one dollar or more and require the purchase of at least one share of stock for five dollars or more. In theory, credit unions are non-profit organizations. They are supposed to be clearing houses for people who have money to loan and for people who want to borrow money.

When a loan is approved by the credit committee, the interest is usually computed the same way as the finance charge on an installment purchase. The rate per month varies from $\frac{1}{2}\%$ to $1\frac{1}{4}\%$. It depends on two things—the rate of interest paid to depositors and the operating expenses of the credit union.

EXAMPLE

Bertha wishes to borrow \$200 from her credit union and pay it back in 12 monthly installments. The rate is $\frac{1}{2}\%$ per month. Find the monthly payment for the loan.

Find the flat rate.

$$\frac{1}{2}\% \text{ for 12 months is } 6\%$$

Multiply the cash unpaid balance (the amount borrowed) by the flat rate.

$$6\% \text{ of } \$200 = 0.06 \times \$200 = \$12$$

The finance charge is \$12. Find the contract unpaid balance.

$$\$200 + \$12 = \$212$$

Divide the contract unpaid balance by the number of months.

$$\$212 \div 12 = \$17.67$$

■ The monthly payment is \$17.67.

EXERCISES Find the monthly payments for these loans.

AMOUNT OF LOAN	RATE PER MONTH	NUMBER OF MONTHS		AMOUNT OF LOAN	RATE PER MONTH	NUMBER OF MONTHS	
1. \$75	$1\frac{1}{2}\%$	6	\$13.63	2. \$100	1%	6	\$17.67
3. \$125	$1\frac{1}{2}\%$	9	\$15.76	4. \$150	1%	9	\$18.17
5. \$200	$1\frac{1}{2}\%$	12	\$19.67	6. \$225	1%	12	\$21.00
7. \$250	$\frac{3}{4}\%$	12	\$22.71	8. \$275	1%	15	\$21.08
9. \$300	$\frac{1}{2}\%$	15	\$21.50	10. \$350	1%	18	\$22.94
11. \$400	$\frac{3}{4}\%$	18	\$25.22	12. \$500	$\frac{1}{2}\%$	18	\$30.28
13. \$600	$\frac{3}{4}\%$	20	\$34.50	14. \$700	$\frac{1}{2}\%$	20	\$38.50
15. \$800	$\frac{1}{2}\%$	22	\$40.36	16. \$900	$\frac{3}{4}\%$	24	\$44.25



CUNA OF ONTARIO CREDIT UNION LIMITED

APPLICATION FOR LOAN

MEMBER'S ACCOUNT NO.

774 D

DATE

June 18

1975

Name (please print)

DIANNA BATT

New Loan Required \$ 220.-

Address

907 Hollywood Road
Toronto
Ontario

BOX-FOR OFFICE USE ONLY

Present Loan Balance \$ 138.-

Total \$ 358.- (1)

Savings \$ 150.-

(2) Payable in blended monthly instalments of \$ 32.52 each, for principal and interest
In addition, I plan to include \$ 10.- with each payment for savings

I would like my payments to fall due the 15 day of each month beginning July 1975

I will make my payments by Payroll Deduction ☒ CU-Matic ☐ Post Dated Cheques ☐

Purpose of this loan To repay existing loan and to pay my husband's hospital bill.

I offer as security

shares and assignment of wages. (4)

Example Savings / Assignment of Wages / Chattel Mortgage on car and / or household contents / Co-Maker / Assignment of Life Insurance / First or Second Mortgage of Real Estate

APPLICANT'S PERSONAL STATEMENT

Employed by Board of Education

City Toronto

How Long 3 yrs.

Position clerk

Take Home Pay \$ 140.-

(Wk. Semi-mo./Mo.) Business Phone 923-0019

Other Income \$ NIL

(Month / Year) Explain

How long at present address 5 years; Board \$

week; Rent \$ 210.-

month

Previous Address 47 Ajax Road Toronto

NATIONAL LIFE INS. CO.

How Long 6 yrs

Previous Employer

Position Clerk

How Long 6 yrs.

Birth Date Jan. 10 1938

Married ☒Single ☐Divorced ☐Separated ☐

No. of Dependent Children NIL

Home Phone 221-1940

Spouse's Name John

Spouse's Employer C.N.R.

How Long 5 yrs.

Position Foreman

Part Time ☐Full Time ☒

Take Home Pay \$ 200.-

(Wk. Semi-mo./Mo.)

Previous Employer

Position

How Long

Automobile(s) — Make and Year CHEV. 1971

Licence #

Collision Insurance \$ 100.-

Deduct

Bank Toronto-Dominion

Branch Yonge & Sheppard

*If less than 5 years, please use this space to provide a 5-year history

A CONSUMER REPORT CONTAINING CREDIT INFORMATION IS BEING OR MAY BE REFERRED TO IN CONNECTION WITH THE CREDIT HEREBY APPLIED FOR OR ANY RENEWAL OR EXTENSION THEREOF.

THE UNDERSIGNED CONSENTS TO THE OBTAINING OF SUCH PERSONAL OR CREDIT INFORMATION AS THE CREDIT UNION MAY REQUIRE AT ANY TIME IN CONNECTION WITH THE CREDIT HEREBY APPLIED FOR, OR ANY RENEWAL OR EXTENSION THEREOF, AND FURTHER CONSENTS TO THE DISCLOSURE OF ANY INFORMATION CONCERNING THE UNDERSIGNED TO ANY CREDIT REPORTING AGENCY, OR ANY PERSON WITH WHOM THE UNDERSIGNED, HAS OR PROPOSES TO HAVE FINANCIAL RELATIONS.

X

D. Batt

Applicant's Signature

On

June 24

1975

I approved

For Office use only —

the above loan for \$ 358.-

Signed

F. B. Switzer

(5)

Loan Officer

Dianna Batt decided to pay her father's hospital bill by obtaining a loan through the Credit Union where she works. She completed this loan application.

① At that time, she was paying off a previous loan of \$138. The balance of this previous loan is included with the new loan to a total of \$358.

② Dianna's repayment plan will include \$32.52 for her

loan principal and interest, plus \$10 each month for her savings account.

③ This monthly payment will be deducted from Dianna's payroll cheque.

④ Dianna used her 150 shares of stock in the Credit Union as security for the loan.

⑤ After Dianna completed the application, the loan was approved by the credit committee.

REVIEW / INSTALLMENT FINANCING

CHECKLIST

Annual rate (p. 202)
Cash selling price (p. 192)
Cash unpaid balance (p. 192)
Consecutive numbers (p. 199)
Contract unpaid balance (p. 192)
Credit union loan (p. 204)
Down payment (p. 192)
Finance charge (p. 192)
Flat rate (p. 194)
Installment contract (p. 197)
Interest charge (p. 202)
Monthly contract (p. 200)
Monthly finance charge (p. 194)
Monthly payment (p. 196)
Personal loan (p. 202)
Rate per month (p. 194)
Simple interest rate (p. 198)
Time selling price (p. 192)
Trade-in allowance (p. 192)

PROBLEMS

In problems 1 through 6, find the finance charges.

1. A clock radio sells for \$55. It can be purchased for \$10 down and \$8.25 per month for 6 months. **\$4.50**
2. A television set sells for \$300. It can be purchased for 20% down and 24 payments of \$12.50 per month. **\$60.00**
3. A dishwasher sells for \$150. It can be purchased for 15% down and 12 payments of \$23.80. **\$158.10**
4. A refrigerator sells for \$275. It can be purchased for \$50 down and 15 installments of \$17.50 each. **\$37.50**
5. A motor boat has a cash selling price of \$950. It can be purchased for \$200 down and 24 payments of \$36.75. **\$132.00**
6. An engagement ring is priced at \$200. It can be purchased for \$50 down and 18 payments of \$9.35 each. **\$18.30**

In problems 7 through 12, find the finance charges for the installment sales.

7. A maple dining room set has a cash selling price of \$375. To finance it, the down payment is \$75 with a 12-month contract at 1% per month. **\$36.00**

8. An electric guitar sells for \$250. The down payment is \$50 and the flat rate is $1\frac{1}{2}\%$ per month for 18 months. **\$54.00**
9. A spinet piano sells for \$495. The down payment is \$95 and the flat rate is $1\frac{1}{4}\%$ for 24 months. **\$120.00**
10. A set of stainless steel dinnerware sells for \$75. The down payment is \$25 and the balance can be financed at 2% per month for 6 months. **\$6.00**
11. An imported English bicycle sells for \$87.50. The down payment is \$20 and the flat rate is $1\frac{1}{2}\%$ per month for 12 months. **\$12.15**
12. A set of aluminum shafted golf clubs sells for \$160. The down payment is \$40 and the flat rate is 1% per month for 12 months. **\$14.40**

In problems 13 through 18, find the amount of the monthly payments for the installment contracts.

13. The cash unpaid balance on a wrist watch is \$95. The finance charge is \$9.10 for 9 monthly payments. **\$11.57**
14. The cash unpaid balance on the purchase of a camera is \$145. To finance it in 12 installments, the charge is \$18.25. **\$13.60**
15. The cash unpaid balance on a pair of binoculars is \$60. The finance charge is \$7.20 on a 6-month contract. **\$11.20**
16. The cash selling price of a tape recorder is \$125. The down payment is 20%. The finance charge is \$24 for 12 months. **\$10.33**
17. The cash selling price of a stereo record player is \$180. The down payment is 25%. The flat rate is $1\frac{1}{4}\%$ for 12 months. **\$12.94**
18. The cash unpaid balance of a portable electric typewriter is \$160. The flat rate is $1\frac{1}{2}\%$ per month for 12 months. **\$15.73**

In problems 19 through 24, find the rate of simple interest to finance the monthly installment contracts. Give the rates to the nearest tenth of a percent.

19. Anthony can buy a \$100 bicycle for \$20 down and pay the balance in 6 payments of \$14.95 each. **41.6%**
20. Alma can buy a pair of diamond earrings for \$120 cash. Or she can pay \$30 down and the balance in 9 installments of \$11.35 each. **\$32.4%**

21. Bruce buys a television set for \$60 down and 12 payments of \$16.80 each. The cash selling price is \$240. **22.2%**
22. Jacqueline buys a moving picture camera for a cash unpaid balance of \$210 payable in 15 installments of \$16.10 each. The cash selling price is \$280 and the down payment is \$70. **22.5%**
23. Ian buys a \$300 set of encyclopedia for \$75 down and pays the balance in 18 installments of \$14.20 each. **17.2%**
24. Gilda buys a trip to the Bahamas for \$400, paying \$100 down and the balance in 21 installments of \$16.50 each. **16.9%**

In problems 25 through 32, find the rate of simple interest to borrow money from the Shark Loan Company.

25. Bess borrows \$50 and repays it in 6 monthly installments of \$9.83 each. **61.6%**
26. Cecil borrows \$100 and pays it back in 9 monthly installments of \$13.60 each. **53.8%**
27. Inez borrows \$150 and pays 12 monthly installments of \$15.50 each. **44.3%**
28. Franklin borrows \$200 and repays it in 15 monthly installments of \$16.33 each. **33.7%**
29. Celeste borrows \$250 and repays it in 18 monthly payments of \$17.65 each. **34.2%**
30. Dexter borrows \$300 and repays it in 21 monthly installments of \$18.80 each. **34.5%**
31. Deborah borrows \$400 and repays it in 24 monthly installments of \$23.65 each. **40.2%**
32. Hamilton borrows \$500 and repays it in 27 monthly payments of \$26 each. **34.6%**

In problems 33 through 38, find the monthly payments for the credit union loans.

33. Ellis borrows \$60 for 6 months with a flat rate of 2% per month. **\$11.20**
34. Eloise borrows \$95 for 10 months with a flat rate of $1\frac{3}{4}\%$ per month. **\$11.16**
35. Gaspar borrows \$125 for 12 months with a flat rate of $1\frac{1}{2}\%$ per month. **\$12.29**
36. Harriet borrows \$175 for 12 months with a flat rate of $1\frac{1}{4}\%$ per month. **\$16.77**
37. Jason borrows \$225 for 12 months with a flat rate of 1% per month. **\$21.00**
38. Keith borrows \$275 for 15 months with a flat rate of $\frac{3}{4}\%$ per month. **\$20.40**

QUESTIONS

1. For installment financing, what is
 - (a) the cash selling price?
 - (b) the time selling price?
 - (c) a down payment?
 - (d) the cash unpaid balance?
 - (e) the contract unpaid balance?
 - (f) a finance charge?
 - (g) a flat rate per month?
2. If a friend needed to borrow money, what advice could you give him?
3. How are the charges for credit union loans determined?
4. How do you estimate the annual rate of simple interest for an installment loan if you know the flat rate per month?
5. How do you find the rate of simple interest for an installment purchase?
6. How do you find the rate of simple interest for a loan from a small loan company?

CHAPTER 17

Research/Discuss

- ☐ Have each member of the class gather data from friends and relatives. Then compile the data and graph it.
- ☐ The policy varies with different companies. In general, the cardholder is liable until the credit company is notified. Most companies now limit the liability of the cardholder to \$50 provided that the company was notified promptly when the loss was discovered.
- ☐ Yes. Although no interest is charged to the customer, the companies charge the vendors a percentage of each sale made with the card.
- ☐ Students should see that with credit buying, people no longer have to save for one item at a time. They can now buy five or six items at once and pay for them gradually. This increases the standard of living.

CHARGE ACCOUNTS

RESEARCH/DISCUSS

- ☐ Why do some people carry more than one kind of credit card? How many do you think most people carry?
- ☐ If your credit card is lost or stolen and someone uses it, what is your responsibility?
- ☐ Do credit card companies make a profit when the cardholder pays his bill promptly?
- ☐ How have charge accounts and credit buying influenced the standard of living in Canada.

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ about credit card buying
- ☐ about department store charge account policies
- ☐ how to verify monthly statements from credit card purchases
- ☐ the difference between revolving charge accounts and bank charge accounts

the bank where people make the difference

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17 a / CREDIT CARD BUYING

Ask students what credit cards are used in their families.

Many people have charge accounts with department stores or oil companies. These allow you to buy on credit and pay later—after receiving a monthly bill. If you pay within a certain time, there is no charge. However, if you want more time, you have to pay a finance charge.

This credit card is typical of those issued by national oil companies. Any automobile purchase, such as gas, oil, tires, and so on, can be made without involving an exchange of cash. The main components are in raised letters.

- ① The account number identifies the customer in all the company's records.
- ② The customer's name is also included. A signature may or may not be required.
- ③ An expiration date is included so that out-of-date cards can be identified. Customers who maintain good credit ratings are issued new cards periodically.



After processing the credit card request (page 209), Chargex issues its credit card.

- ① The signature is the same as on the application. This same signature must be used whenever a purchase is made using the credit card.
- ② The number 4 520 220 101 391 is Mr. Napier's account number, printed in letters a computer can read.
- ③ This card can be used until the end of February, 1976. If Mr. Napier has paid his bills regularly, he will probably be issued a new card at that time.

Project: Visit a retail credit bureau and find out what kinds of information they maintain about persons seeking credit. Find out whether they allow the consumer access to his own file.

Many people also have bank credit cards. You can use a bank credit card at hundreds of stores, hotels, motels, restaurants, and airlines. The bank pays the firm and bills you each month for all your purchases.

As with all credit card buying, there is a finance charge for a bank credit card if you do not pay within a certain time. The rates below are typical of bank credit card financing.

Monthly Rate	Unpaid Balance
1½%	Up to and including \$1000
1%	Over \$1000 up to and including \$2500
0.8%	Over \$2500

Remind students that the annual rate is 12 times the monthly rate.

A monthly rate of 1½% is the same as a yearly simple interest rate of 18%.



There is also a minimum payment due every month. This chart shows typical minimum payments for bank credit cards.

New Balance	Minimum Payment
Under \$10	Amount of balance
\$10 to \$200	\$10
Over \$200	5% of new balance

Note that \$10 is 5% of \$200.

EXAMPLE

Yvonne has an unpaid balance of \$714.74. If she added no new purchases during the month, what is the interest charge and the minimum monthly payment? Use the schedules above.

Since the unpaid balance is under \$1000, the rate of interest is 1½%.

$$1\frac{1}{2}\% = 0.015$$

$$0.015 \times \$714.74 = \$10.72$$

- The interest charge is \$10.72.

Find the closing balance.

Opening balance	\$714.74
Interest charge	+ 10.72
Closing balance	\$725.46

Since the closing balance is over \$200, the minimum payment is 5% of the closing balance.

$$5\% = 0.05$$

$$0.05 \times \$725.46 = \$36.27$$

- The minimum monthly payment is \$36.27.

Discussion Question: What are the advantages and disadvantages of charge accounts and bank credit cards?

Consider: Risk if card is stolen; ease in returning defective merchandise; tendency toward overbuying; personal safety in carrying little or no cash; ease in purchasing large items; and so on.

EXERCISES Find the interest charge and the minimum monthly payment for these opening balances. No new purchases have been made during the month. Use the schedules above.

- | | | |
|-----------------------------------|-----------------------------------|------------------------------------|
| 1. \$48.27 \$0.72; \$10.00 | 2. \$93.56 \$140; \$10.00 | 3. \$223.38 \$3.35; \$11.34 |
| 4. \$469.49 \$7.04; \$23.83 | 5. \$721.82 \$10.83; \$36.63 | 6. \$815.95 \$12.24; \$41.41 |
| 7. \$903.76 \$13.56; \$45.87 | 8. \$954.38 \$14.32; \$48.44 | 9. \$1033.25 \$10.33; \$52.18 |
| 10. \$1746.16 \$17.46; \$88.18 | 11. \$1954.27 \$19.54; \$98.69 | 12. \$2510.73 \$20.09; \$126.54 |

17 b / CREDIT CARD BUYING

A bank credit card has additional advantages over a regular charge account.



- Establishment of credit at hundreds of firms with one application.
- Payment of all bills with one cheque.

Discussion Question: Is credit card insurance worth getting? Consider: Service provided; cost of insurance; risk of theft. Is the total loss reimbursed? Do some credit card companies limit liability automatically upon notification of loss?

The disadvantages are the same as those for any charge account—the danger of overbuying and the risk of loss or theft of your card. Some credit card companies now carry insurance so that if your card is lost or stolen, your loss is limited to \$50.

If you have a bank credit card, you receive a statement each month from the bank. Just as it is important to verify your monthly chequing account statement, it is important to verify your credit card statement.

CHARGE X
TORONTO DOMINION

MAKE CHEQUE OR MONEY ORDER PAYABLE TO
CHEQUE OU MANDAT À L'ORDRE DE

TORONTO DOMINION
CHARGE X DATA CENTRE
BOX 222, T D CENTRE
TORONTO, ONT M5K 1J3

Ronald Napier
310 Wyndott Dr.
Halifax, N.S.

PLEASE DETACH AND ENCLOSE THIS PORTION WITH YOUR PAYMENT IN ENVELOPE PROVIDED TO ENSURE PROPER CREDIT.
VEUILLEZ DÉTACHER CETTE PARTIE ET LA PLACER AVEC VOTRE PAIEMENT DANS L'ENVELOPPE FOURNIE AFIN QUE VOTRE COMPTE SOIT CRÉDITÉ CORRECTEMENT.

TRANSACTION DATE DATE DE LA TRANSACTION	REFERENCE NO. N° DE RÉFÉRENCE	DESCRIPTION OF TRANSACTION DESCRIPTION DE LA TRANSACTION	AMOUNT MONTANT
Dec 12 '75	00894C	Turner's Garage Surrey	46.11
Dec 13 '75	851700	Hilsnuts Lt'd Oakville	36.11
Jan 04 '76	039158	Fortune Hair Dressers Surrey	7.00
		Interest	0.19
STATEMENT DATE DATE DU BILLET	BALANCE ON LAST STATEMENT SOLDE REPORTÉ	PAYMENTS PAIEMENTS	INTEREST INTÉRÊT
Jan 09 '76	32.59	20.00	0.19
			NEW CHARGES NOUVEAUX DÉBITES
			89.22
			MINIMUM PAYMENT PAIEMENT MINIMUM
			10.00

REPORT ANY DISCREPANCIES TO
SIGNALÉZ TOUTE ERREUR À

SEE REVERSE VOIR AU VERSO

Mr. Napier receives a statement each month for his ChargeX credit card.

- ① This line shows that in the preceding month, he paid \$20 on his balance of \$32.59.
- ② The unpaid balance is \$12.59. This is the amount the finance is figured on: $1\frac{1}{2}\%$ of \$12.59 is \$0.19.
- ③ If Mr. Napier did not make a payment last month or if his payment was late, a late charge would be recorded.

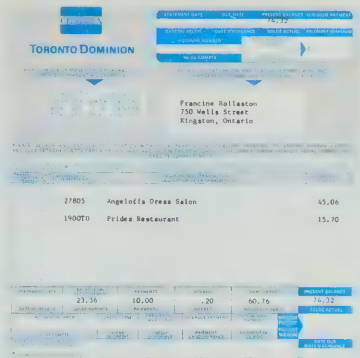
④ The new balance is the sum of the unpaid balance, the finance charge, and the purchases.

⑤ Mr. Napier has to make a minimum payment of \$10 to keep his good credit rating. Of course, he can pay more.

⑥ Compare this date and the statement date. A late charge will be added if payment is not received within 15 days.

EXAMPLE

Francine received her monthly credit card statement as shown below. Verify the balance due of \$74.32.



Find the opening balance.

Prior balance	\$23.36
Payment	− 10.00
Opening balance	\$13.36

Find the interest charge for the unpaid balance.

$1\frac{1}{2}\% = 0.015$
 $0.015 \times \$13.36 = \0.20

Find the sum of the opening balance, the interest charge, and the new purchases

Opening balance	\$13.36
Interest charge	0.20
New purchases	60.76
	\$74.32

■ The closing balance is \$74.32.

Project: Visit your local police department and find out if they have very many reports of stolen credit cards in your community. What is the responsibility of the owner of a stolen credit card when it is fraudulently used?

Project: Computers play an important role in credit card purchasing. Ask a bank representative to explain the coding on the card and how the computer bills each consumer monthly. Find out what happens when a computer makes a mistake. How many hours are saved by the computer in computing monthly bills?

EXERCISES Verify these bank credit card monthly statements. On unpaid balances, the bank charges 1½% interest per month. *Answers are in back of book.*

PRIOR				CLOSING			
BALANCE	PAYMENT	PURCHASES	BALANCE	BALANCE	PAYMENT	PURCHASES	BALANCE
1. \$62.05	\$10.00	\$31.15	\$83.98	2. \$45.50	\$10.00	\$29.63	\$65.66
3. \$51.25	none	\$92.00	\$144.02	4. \$80.19	\$20.00	\$84.27	\$145.36
5. \$75.92	\$10.00	\$25.78	\$92.69	6. \$94.26	\$10.00	\$34.47	\$119.99
7. \$105.15	\$20.00	\$38.75	\$125.18	8. \$125.12	\$20.00	\$20.33	\$127.03
9. \$80.27	none	\$23.19	\$104.66	10. \$95.33	none	\$42.29	\$139.05
11. \$70.53	\$10.00	\$15.75	\$77.19	12. \$103.12	\$10.00	\$48.07	\$142.59
13. \$152.11	\$15.00	\$28.36	\$167.53	14. \$145.10	\$30.00	\$37.52	\$154.35
15. \$130.18	\$20.00	\$95.78	\$207.61	16. \$217.86	\$50.00	\$61.15	\$231.53

17 C / REVOLVING CHARGE ACCOUNTS

Project: Visit the credit department of a store that has charge accounts and find out what the terms are for credit buyers. Find out how many credit plans they offer and what they are.

Have students bring in various advertisements. Have them find out how many mention the possibility of credit purchase. Discuss how credit is used as an inducement to shop at a particular store.

Point out that it is in the best interest of the consumer to "shop for credit" at the same time he is shopping for a major item. He should be sure the item will outlast the credit payments.

Most large department stores do not accept bank credit cards. They prefer to handle their own credit business. There are two reasons for this:

- (1) Banks charge the stores about 3% of the amount of the sale for this service.
- (2) The interest from credit financing is a profitable source of income.

Charge accounts at department stores are usually called *revolving charge accounts*. The only difference between a bank charge account and a revolving charge account is the rate schedule. On balances under \$500, the usual charge for both is 1½%. On balances over \$500, banks usually charge 1½% (up to and including \$1000). However, the revolving account interest charge on balances over \$500 is normally only 1%. The interest is lower on the revolving charge account because the store is making a profit on the sale of the merchandise. This is more important than the additional finance charge. Also, if the finance rates are too high, they might discourage customers from buying higher-priced goods.

The minimum monthly payment for a revolving account is usually the same as for a bank credit-card account. Most stores require a minimum of \$10 per month on balances up to \$200 and 5% of the new balance on balances over \$200.

EXAMPLE

Kathleen received her statement from the department store where she has a revolving charge account. Find the interest on her account, her minimum monthly payment, and the new balance after the minimum payment has been made.

REEDS DEPARTMENT STORE EDMONTON		REEDS DEPARTMENT STORE PLEASE KEEP THIS PART	
DATE 28/02/74		ACCOUNT NUMBER 156 3608684	ACCOUNT TYPE 03 02 74
PREVIOUS BALANCE 73 26		PAYMENTS	
FINANCE CHARGE		CREDITS	
NEW PURCHASES 28 35		NEW BALANCE	
NEW BALANCE		MINIMUM MONTHLY PAYMENT	
UNDER \$200 OVER \$200		\$10.00 5% OF NEW BALANCE	

IF YOUR NAME AND ADDRESS ARE INCORRECT
WRITE CORRECTIONS AND PUNCH OUT HOLE →

Miss Kathleen Reynolds
1434 16TH AVE
Edmonton, Alberta

AMOUNT ENCLOSED

156 3608684 1200000200002

ACCOUNT NUMBER OFFICE USE ONLY

PLEASE RETURN THIS PART WHEN PAYING BY MAIL.
WHEN PAYING IN PERSON, PLEASE BRING ENTIRE STATEMENT

33166 3805

THE FINANCE CHARGE, IF ANY, IS FIGURED ON THE PREVIOUS BALANCE BEFORE DEDUCTING PAYMENTS OR CREDITS THE PERIODIC RATES USED ARE 1½% OF THE ABOVE DETERMINED BALANCE IN AMOUNTS OF \$500 OR LESS, AND 1% OF AMOUNTS IN EXCESS OF \$500 WHICH ARE ANNUAL PERCENTAGE RATES OF 18% AND 12% RESPECTIVELY.

Since the opening balance is under \$500, the interest rate is $1\frac{1}{2}\%$.

$$1\frac{1}{2}\% = 0.015$$

$$0.015 \times \$73.26 = \$1.10$$

- The interest is \$1.10.

Find the closing balance.

Opening balance	\$73.26
Interest charge	1.10
New purchases	28.35
Closing balance	<u>\$102.71</u>

- Since the closing balance is under \$200, the minimum payment is \$10.00.

Find the balance after the minimum payment has been made.

$$\$102.71 - \$10.00 = \$92.71$$

- The new balance is \$92.71.

FACT AND FIGURES

In 1973, there was \$1 144 000 000 worth of credit outstanding in charge accounts at department stores and electrical appliance stores in Canada.

In 1973, of the Canadian homes wired for electricity, it was estimated that 86.4% had electric coffeemakers, 99.5% had electric irons, 99.7% had radios, 99.8% had refrigerators, 98.7% had television (black and white), 91.0% had toasters, 90.7% had vacuum cleaners, and 91.9% had clothes washers.

Facts and Figures

How much would this be per capita for the total population of Canada?

What appear to be the most important home appliances?

EXERCISES Find the interest, minimum payment, and the balance after the minimum has been paid for each account below. Use the following rate and payment tables.

Monthly Rate	Unpaid Balance	New Balance	Minimum Payment
$1\frac{1}{2}\%$	Up to \$500	Under \$200	\$10
1%	Over \$500	Over \$200	5% of new balance

Have students compare these charts with those for the bank credit cards.

OPENING BALANCE		PURCHASES		OPENING BALANCE		PURCHASES	
1.	\$40.29	\$17.28	\$0.60; \$10.00; \$48.17	2.	\$63.14	\$21.95	\$0.95; \$10.00; \$76.04
3.	\$74.10	none	\$1.11; \$10.00; \$65.21	4.	\$89.23	\$23.72	\$1.34; \$10.00; \$104.29
5.	\$105.15	\$33.26	\$1.58; \$10.00; \$129.99	6.	\$154.57	none	\$2.32; \$10.00; \$146.89
7.	\$190.63	\$28.75	\$2.86; \$11.11; \$211.13	8.	\$196.38	\$52.43	\$2.95; \$12.59; \$239.17
9.	\$237.51	\$42.18	\$3.56; \$14.16; \$269.09	10.	\$316.22	none	\$4.74; \$16.05; \$304.91
11.	\$425.14	\$15.31	\$6.38; \$22.34; \$424.49	12.	\$481.07	\$32.50	\$7.22; \$26.04; \$494.75
13.	\$520.94	none	\$5.21; \$26.31; \$499.84	14.	\$563.18	\$27.55	\$5.63; \$29.82; \$566.54
15.	\$589.79	\$48.76	\$5.90; \$32.22; \$612.23	16.	\$601.56	\$51.28	\$6.02; \$32.94; \$625.92

REVIEW / CHARGE ACCOUNTS

CHECKLIST

Bank credit card (p. 210)
Charge account (p. 210)
Closing balance (p. 211)
Credit card (p. 210)
Finance charge (p. 210)
Interest charge (p. 211)
Minimum monthly payment (p. 211)
Monthly rate (p. 210)
Monthly statement (p. 212)
Opening balance (p. 211)
Prior balance (p. 213)
Purchases (p. 211)
Revolving charge account (p. 214)
Unpaid balance (p. 211)

PROBLEMS

In problems 1 through 9, find the interest charge and the minimum monthly payment after purchases are added. Use the schedules on page 211.

1. Quagmire had an opening balance of \$83.80 and purchases of \$20.96. **\$1.26; \$10.00**
2. Laura had an opening balance of \$163.19 and purchases of \$48.22. **\$2.45; \$10.69**
3. Oswald had an opening balance of \$253.47 and no new purchases. **\$3.80; \$12.86**
4. Winifred had an opening balance of \$359.91 and purchases of \$25.61. **\$5.40; \$19.55**
5. Warren had an opening balance of \$415.07 and purchases of \$38.23 of which he returned \$12.60 for credit to his account. **\$6.23; \$22.35**
6. Mabel had an opening balance of \$544.70 and no new purchases. **\$8.17; \$27.64**
7. Paul had an opening balance of \$585.73 and purchases of \$76.63 of which he returned \$26.25 for credit to his account. **\$8.79; \$32.25**
8. Sadie had an opening balance of \$601.07 and had purchases of \$83.52. **\$9.02; \$34.68**
9. Quincy had a balance of \$644.19 and no new purchases. **\$9.66; \$32.69**

In problems 10 through 18, compute the closing bal-

ances. In each case, the minimum payment was made on the prior balance. Use the schedules on page 211.

10. Terence has a prior balance of \$63.27 and purchases of \$27.15. **\$81.22**
11. Ruby has a prior balance of \$88.54 and made purchases of \$23.62. **\$103.34**
12. Lafayette had a prior balance of \$109.48 and made purchases of \$30.12. **\$131.10**
13. Naomi had a prior balance of \$159.27 with her Master Charge card account and made purchases of \$28.11. **\$179.62**
14. Malcolm had a prior balance of \$252.43 with his Chargex card account. He made no new purchases during the month. **\$243.41**
15. Pearl had a prior balance of \$291.76 with her Chargex card account and made purchases of \$33.49. **\$314.82**
16. Vernon had a prior balance of \$321.64 with his Chargex card account and made purchases of \$50.81 during the month. **\$360.95**
17. Opal had a prior balance of \$444.92 with her Dinner Club card account. No additional charges were made during the month. **\$429.01**
18. Schyler had a prior balance of \$577.12 with his Easy card account and made purchases of \$15.69 during the month. **\$572.18**

In problems 19 through 24, find the balance after the payment has been made. Use the schedules on page 215.

19. Teresa had an opening balance of \$113.15, purchases of \$17.90, and chose to make a minimum payment. **\$122.75**
20. Simon had an opening balance of \$298.33, purchases of \$28.09, and chose to pay \$50. **\$280.89**
21. Valerie had an opening balance of \$324.67, purchases of \$23.15, and chose to pay \$75. **\$277.69**
22. Ulysses had an opening balance of \$467.62, made no purchases, and paid the minimum. **\$450.90**
23. Wilma had an opening balance of \$516.98, made no purchases, and paid \$100. **\$422.15**
24. Walter had an opening balance of \$657.54, purchases of \$53.77, and paid \$100. **\$617.89**

QUESTIONS

1. What are the advantages and disadvantages of buying on credit?
2. How do banks make a profit on their credit card business if they do not charge interest on accounts paid when billed?
3. What is the usual rate per month for revolving accounts and bank credit card accounts when the unpaid balance is \$500 or less?
4. How do you convert a monthly rate of interest to an annual rate?
5. What are the usual minimum monthly payments required for revolving charge accounts and bank credit card accounts?
6. Why have some large stores not affiliated with the bank credit card plans?
7. Are there any differences between a revolving charge account and a bank credit card plan?



A Checklist For Success

"Hey, Mom, do I have a clean shirt? I've got a job interview in an hour," Phil announced.

"What's got into you, Phil?" his mother asked. "Here it is, the middle of March and you're already looking for a summer job!"

"Remember last summer?" Phil asked. "I didn't start looking until school was out. And I didn't land a thing until July 27th. For four weeks I had to get up at 3:30 in the morning to help distribute newspapers to the carriers."

"You should complain!" his mother said. "I was the one who had to wake you up every morning. What kind of job are you trying to line up?"

"Well, I've got two possibilities so far. One is a busboy job at the Gay Nineties Ice Cream Shop and the

other is a nursery assistant at Wilson's Garden Company.

"I'd like a summer job that will continue on part-time during the school year. But I also want to be able to try out for baseball next spring. The busboy job is all summer continuing part-time during school. The pay is \$2.70 an hour and tips shared with the waitresses. They provide the uniforms..."

"But I'll have to keep them clean," his mother pointed out. "How far away is the ice cream store? Will they let you off for baseball?"

"I don't know. The nursery job means helping plant lawns and shrubs, and delivering plants, compost, and fencing materials. It's an outdoor job, which would be good, but it doesn't continue during the school year."

"Well, that means you could go out for baseball next spring. Maybe you should make up a checklist of things to ask about in the interview."

Together they prepared the following list.

JOB HUNTING CHECKLIST

- LOCATION:** How far is it from school? from home?
- TRANSPORTATION:** How can you get there and back? Is there public transportation? Are there special buses for employees?
- HOURS:** How many hours a day? Are there any evening hours? Do you work on Saturdays, Sundays, or holidays? Is there any possibility of extra work? Are you ever on call?
- STATUS:** Is the job permanent or temporary? Are you classified as full-time, part-time, or on call?
- STRICTNESS:** If you miss work for special school events, can you make up the time or do you lose pay?
- UNIFORMS:** Is a uniform required? Who supplies it and keeps it clean? Is there a locker room or storage area available on the premises?
- RESPONSIBILITY:** Are you responsible for the work of others? Are you responsible for expensive merchandise or equipment? Do you work without supervision?
- SPECIAL SKILLS:** Do you have to be able to drive a car or truck? Do you have to work machines such as multi-button phones, switchboards, or business machines? Do you have to have special skills such as typing, shorthand, writing, or arithmetic? Is the work outdoors or indoors? Is there any heavy lifting required?
- PAY:** What is the basic rate? Is it the same for Saturdays, Sundays, and holidays? Is there extra pay for working more than eight hours in one day?
- BENEFITS:** Are there medical, insurance, or profit-sharing benefits? Are there any paid holidays? Do the employees get a discount on purchases? If the work is in a restaurant, are meals included? Is there any possibility of advancement?

“Whew,” said Phil when they had finished the list. “This is a lot of information about one job. What do you think he’ll ask me at the interview?”

His mother thought a moment. “I’m not sure exactly,” she said. “But he’ll try to find out whether you are capable of doing the work, whether you will show up when you’re supposed to, whether your available hours are the same as those he needs, whether you’ll take your work seriously, whether you can be trusted to handle unusual situations without insulting customers, whether you’re reliable enough to work by yourself—like for a delivery job.

“But remember, it’s a two-way street. You must let him know that you’re a desirable person, worth being employed. Tell him the subjects you like best in school, those you did well in. Tell him about that job you had last summer, too. The fact that you’ve applied so early shows you’re serious. You’ve been conscientious in your school work and punctual. Tell him that you’ve only missed four days of school in the last two years. I think you’ll make a good impression.”

Phil grumbled, “Thanks, Mom,” as he went out the door.

Research/Discuss

- ☐ Discuss generally the various paycheque deductions.
- ☐ Elicit student ideas on this topic, pointing out that people on commission can usually be more independ-

CHAPTER 18

ent and do not have a limit on their income.

- ☐ The government is concerned that too many people would not participate in the program if it were optional. Discuss the result this would have on people already collecting a pension.
- ☐ Income taxes could be collected once each year, but this would be such a large amount that it would be difficult for many people to pay them unless they budgeted carefully. Also, taking the income tax before the wage earner has possession of it is a painless way to collect it. Besides, since money has value in relation to time, the government can earn interest on the taxes by receiving them in advance of the due date. This means they are actually charging a higher tax rate.

THE PAYCHEQUE

RESEARCH/DISCUSS

- ☐ Why isn't it possible to spend all the money that you earn on a job?
- ☐ Why do some people prefer to work for a commission rather than a fixed salary?
- ☐ Why isn't the Canada Pension Plan an optional program so that each worker could decide if he wanted to participate?
- ☐ The government has adopted a pay-as-you-earn income tax withholding plan. What other ways could these taxes be collected?

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ some common methods for compensating employees for their work
- ☐ how to compute gross and net earnings
- ☐ about deductions for Canada Pension, income taxes, hospital and medical insurance, and unemployment insurance
- ☐ how to figure your income tax withholding deductions from your paycheque
- ☐ how to prepare a payroll

⑥ Total deductions are \$73.86, subtract this amount from \$253 to obtain the net pay.

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18 a / HOURLY WAGES

The four-day week with ten hours a day is a new version of the forty-hour week. This allows workers a three-day weekend. Some unions do not like this version of the four-day week since it requires two hours over the regular eight-hour day prescribed in the union contracts.

Discussion Question: How would a four-day, forty-hour week affect the business community in your area?

Consider: How various businesses would adapt; how recreation facilities might change?

Let students contact the Department of Labour and ascertain information concerning minimum wages and special wage rates for part-time employees and students.

Everyone looks forward to payday—whether it comes once a month, twice a month, or once a week. The method of payment depends on the type of work you do. Professionals, office workers, clerks, etc. are usually paid a salary, while members of labour unions, skilled and unskilled labourers, part-time employees, students, etc. are paid wages according to the number of hours worked in a week. Many companies are considering 32-hour, 4-day weeks, but the 40-hour, 5-day week is still most common. More than 40 hours is considered *overtime*, and the hourly pay rate is higher. Usually the hourly rate for overtime is *time-and-one-half*. That is, the overtime rate is $1\frac{1}{2}$ times the *regular time rate*. Overtime on Sundays and statutory holidays may be double or triple the regular time rate.

Thus, if someone is paid by the hour, the *gross wages* (wages before deductions) are found as follows:

$$\text{Gross Wages} = \text{Number of hours worked} \times \text{Rate per hour}$$

EXAMPLE

Lynn, a high-school student, works at a bakery after school. She works 3 hours each day and 8 hours on Saturdays. She is paid \$1.75 per hour. Find her gross wages.

Find the number of hours worked.

$$\begin{array}{r} 5 \text{ days} \times 3 \text{ hours} = 15 \text{ hours} \\ \text{Saturday} \quad \quad \quad + \quad \underline{8 \text{ hours}} \\ \hline 23 \text{ hours} \end{array}$$

Multiply to find the gross wages.

$$23 \times \$1.75 = \$40.25$$

- Her gross wages are \$40.25.

EXAMPLE

Bennett works at the post office and is paid \$3.40 per hour up to a 40-hour week. He is paid time-and-one-half for overtime. One week during Christmas rush, Bennett worked 40 hours regular time and 18 hours overtime. Find his gross wages.

Find the regular time pay.

$$40 \times \$3.40 = \$136$$

Find the overtime pay.

$$\text{Rate per hour} = 1\frac{1}{2} \times \$3.40 = \$5.10$$

$$18 \times \$5.10 = \$91.80$$

Add the regular time pay and the overtime pay.

$$\$136.00 + \$91.80 = \$227.80$$

- His gross wages for the week were \$227.80.

NAME <u>John MacDonald</u>							
NUMBER <u>32342</u>							
DEPARTMENT <u>Manufacturing</u>							
WEEK ENDING <u>July 27, 1976</u>							
DAY	MORNING		AFTERNOON		OVERTIME		HOURS
	IN	OUT	IN	OUT	IN	OUT	
MON	8.00	11.56	12.55	5.01			8
TUES	8.03	12.01	1.00	5.00			8
WED	8.05	11.59	1.04	4.53			8
THUR	7.57	11.45	1.06	5.07			7½
FRI	7.55	12.05	12.45	4.35			7½
SAT							
SUN							
				HOURS	RATE	AMOUNT	
REGULAR				39½	2.80	109.90	
OVERTIME							
TOTAL HOURS				39½	TOTAL EARNINGS	109.90	

Many ways are used to record the time an employee spends on the job.

- ① This time card is inserted in a time clock that stamps the time of each arrival and departure.
- ② At the end of the week, a clerk in the payroll department computes the total time to the nearest quarter-hour.
- ③ Most companies, like this one, allow a 15-minute grace period for an employee arriving late or leaving early.
- ④ If an employee exceeds this grace period, he loses pay.
- ⑤ However, a company will not pay overtime for any time spent before the beginning of the work day or during the lunch hour, unless it is authorized by a supervisor.
- ⑥ The total time and earnings are used by the payroll clerk to prepare the paycheck.

EXERCISES Find the gross wages for each of the following.

HOURS WORKED				WAGES PER HOUR			
REGULAR		OVERTIME		REGULAR		OVERTIME	
1.	20		\$35.00		\$1.75		
2.	24		\$45.60		\$1.90		
3.	27		\$55.35		\$2.05		
4.	32		\$78.40		\$2.45		
5.	40		\$102.80		\$2.57		
6.	40		\$110.00		\$2.75		
7.	40		\$115.00		\$2.875		
8.	40		\$119.00		\$2.975		
9.	40	2	\$148.35		\$3.45		\$5.175
10.	40	4	\$173.88		\$3.78		\$5.67
11.	40	3	\$178.89		\$4.02		\$6.03
12.	40	5	\$202.83		\$4.27		\$6.405
13.	40	8	\$240.76		\$4.63		Time-and-one-half
14.	40	10	\$280.50		\$5.10		Time-and-one-half
15.	40	12	\$372.94		\$6.43		Time-and-one-half
16.	40	15	\$425.00		\$6.80		Time-and-one-half

18 b / PIECE-RATE WAGES

For many years, factory workers were paid according to how much work they did. Those who were more skilled earned more than those who were less capable. For the employer, the system had several advantages.



- There was an incentive for workers to produce more.
- People who didn't work as hard didn't have to be paid as much.

Discussion Question: What changes would occur in harvesting by hand if the piece-rate wages were changed to hourly wages?

Consider: Changes in the lives of migrant workers; decrease in the number of small farms; increase in the price of produce.

Unfortunately, under this system, employees were often severely over-worked. As workers organized into unions, they bargained for hourly wage rates over piece-rates. Today, skilled and semi-skilled workers are paid by the hour. However, there are still some unskilled workers who are paid piece-rate wages.

Some harvesting, and fruit picking, is still on a piece-rate basis. In the apple industry, for example, workers are paid \$1.10 for each carton picked. A worker can pick on the average 3.5 cartons per hour. The average hourly rate is $3.5 \times \$1.10 = \3.85 .

WORKER	NUMBER OF CRATES	TOTAL	WAGES AT 51¢/CRATE
LEWIS		32	\$16.32
HAMPTON		37	\$18.87
LONG		45	\$22.95
REILLY		34	\$17.34
WELLS		44	\$22.44
GOMEZ		51	\$26.01

Harvesting by hand may be recorded on a tally sheet. As each worker fills a crate, a truck picks it up, and credits him on the sheet.

① Tally marks are used to record the number of crates.

② At the end of the day, the tally marks are totalled, and the wages are computed. Harvest workers are usually paid each day for their work.

EXAMPLE

Lois went apple picking for a week. On Monday she picked 26 cartons; Tuesday, 28 cartons; Wednesday, 25 cartons; Thursday, 26 cartons; Friday, 27 cartons. Find her gross wages for the week if the farmer was paying \$1.15 per carton.

Find the total number of cartons for the week.

$$26 + 28 + 25 + 26 + 27 = 132$$

Multiply to find the gross wages.

$$132 \times \$1.15 = \$151.80$$

- Her gross wages for the week were \$151.80.

In the grape industry, pickers are paid \$0.50 per box, and the average worker can pick 7 boxes an hour. This is an hourly rate of \$3.25.

EXAMPLE

Eric took a summer job in a vineyard picking grapes. An average week was as follows: Monday, 49 boxes; Tuesday, 51 boxes; Wednesday, 48 boxes; Thursday, 51 boxes; Friday, 48 boxes; Saturday morning, 27 boxes. Find his gross wages for the week at the rate of \$0.50 per box.

Find the total number of boxes for the week.

$$49 + 51 + 48 + 51 + 48 + 27 = 274$$

Multiply to find the gross wages.

$$274 \times \$0.50 = \$137$$

- His gross wages for the week are \$137.

EXERCISES In problems 1 through 6, the workers are picking lettuce at a piece-rate of \$0.32 a carton. Find the gross wages for the week for each.

WORKER	MON.	TUES.	WED.	THURS.	FRI.	SAT.	
1. Diana	81	80	79	80	80	78	\$152.96
2. Titus	82	81	81	79	80	79	\$154.24
3. Carmen	81	80	80	79	80	81	\$153.92
4. Jenny	69	65	71	62	64	65	\$126.72
5. Jasper	82	78	78	80	79	80	\$152.64
6. Marcus	83	76	84	83	82	85	\$157.76

In problems 7 through 12, the workers are picking tomatoes at a piece-rate of \$0.50 per box. Find the gross wages for the week for each.

WORKER	MON.	TUES.	WED.	THURS.	FRI.	SAT.	
7. Nathan	48	47	49	48	50	47	\$144.50
8. Cassandra	49	50	48	49	48	50	\$147.00
9. Dominick	42	39	44	45	40	40	\$125.00
10. Tessie	50	47	46	48	49	48	\$144.00
11. Egbert	49	46	47	49	50	45	\$143.00
12. Gerard	49	46	47	50	48	47	\$143.50

Many salesmen work on a *straight commission* basis. This means they are paid a percent of the amount they sell—the more they sell, the greater their wages. Straight commission jobs have advantages and disadvantages.



- There is no maximum wage—you can increase your wages by working harder.
- You are nearly self-employed—no one tells you exactly what to do nor when to do it.



- You don't have a guaranteed fixed income every month.

Project: Find out what part commission plays in real estate sales. What percent of the selling price of a house is taken in commission? Who receives the commission?

Life insurance salesmen are also paid small commissions when renewal premiums are paid during the first ten years. Rates range from 2% to 5%.

The commissions can be on a sliding scale, so that the percent of commission increases as sales increase. The commission rate also varies with the product being sold. The commission rates for a life insurance salesman are different from those for a real estate salesman or an investment securities salesman.

Table 18.1 shows the commission schedule for the Methuselah Life Insurance Company. These rates are typical of the life insurance industry. The commission rates are different for different kinds of policies because the annual premiums vary. Note that a commission is paid only on the first-year premium, not on the amount of the policy.

Code Number	Commissions on First-Year Premiums	
100	Whole life	55%
101	20 payment life	50%
102	10 payment life	30%
103	Single payment life	5%
104	Endowment age 85	65%
105	20 year endowment	40%
106	15 year endowment	30%
107	10 year endowment	20%
108	Life paid up at age 65	60%
109	Retirement income age 65	50%
110	Term to age 65	40%

table 18.1 Commission Schedule Methuselah Life Insurance Company

EXAMPLE

Kevin, a salesman for the Methuselah Life Insurance Company, received his commission cheque for September based on the following paid premiums.

CONTRACT	FIRST-YEAR PREMIUM
Whole life	\$855
20 year endowments	\$326
Life paid up at 65	\$227

Find Kevin's gross commissions for the month.

Find the commission on the whole life contracts.

$$0.55 \times \$855 = \$470.25$$

Find the commission on the 20 year endowment contracts.

$$0.40 \times \$326 = \$130.40$$

Find the commission on the life paid up at 65 contracts.

$$0.60 \times \$227 = \$136.20$$

Find the sum of the commissions.

$$\$470.25 + \$130.40 + \$136.20 = \$736.85$$

- Kevin's gross commissions for September are \$736.85.

FACTS AND FIGURES

In 1961, there were 4 694 000 males and 1 764 000 females in the labour force, I.E. 72.7% of the labour force was male and 27.3% was female.

In 1971, these figures were 5 745 000 males and 2 931 000 females, I.E. 66.2% male and 33.8% female.

Facts and Figures

What could be the cause of the increase of females in the labour force?

What, if any, affects could this have on the economy?

EXERCISES Find the gross commissions for the month for these life insurance salesmen. Use table 18.1 to find the code numbers and percentages. The code numbers are in parentheses.

1. Archibald: \$295 (100), \$316 (101), \$135 (104), \$33 (108) **\$427.80**
2. Wesley: \$753 (100), \$240 (105), \$604 (108), \$39 (110) **\$888.15**
3. Ira: \$829 (100), \$658 (106), \$471 (109)
4. Scott: \$137 (100), \$67 (102), \$182 (104), \$680 (109) **\$553.75**
5. Dagmar: \$491 (100), \$92 (102), \$359 (105), \$301 (109) **\$591.75**
6. Lance: \$851 (100), \$607 (101), \$24 (108) **\$785.95**
7. Quentin: \$1827 (100), \$293 (104) **\$1195.30**
8. Eldred: \$637 (100), \$892 (106), \$93 (107), \$278 (109) **\$775.55**
9. Vincent: \$418 (100), \$659 (105), \$230 (107), \$144 (110) **\$597.10**
10. Elsie: \$776 (100), \$45 (101), \$368 (104), \$494 (106) **\$836.70**
11. Vera: \$459 (100), \$149 (102), \$795 (104), \$316 (109) **\$971.90**
12. Armand: \$627 (100), \$89 (101), \$1974 (103), \$216 (108) **\$617.65**
13. Wilbur: \$2038 (100), \$1894 (104) **\$2352.00**
14. Barney: \$316 (100), \$55 (101), \$311 (104), \$883 (108), \$578 (110) **\$1164.45**
15. Amy: \$1585 (100), \$115 (102), \$247 (104), \$659 (108), \$222 (109), \$295 (110) **\$1691.20**
16. Van: \$927 (100), \$784 (101), \$3027 (103), \$135 (105), \$573 (107), \$406 (109), \$350 (110) **\$1564.80**

18 d / SALARY PLUS A COMMISSION

In retail sales, the sales person is often paid both a salary and commission. The idea of this is to motivate the sales person to sell more. A sales quota is set and the sales person receives a commission on everything sold over the quota. For example, if you are working in a shoe store and the quota is \$500 and you sell \$800, you will receive a commission on \$800—\$500 or \$300. Since the commission is additional, on top of your salary, the percentage would usually be quite small—probably anywhere between 1% and 5%. There are other combinations of both a salary and a commission.



- Salary plus a commission on *everything* sold.
- Salary plus a commission on everything sold if the quota is made.

The Harrington Life Insurance Company sends each salesman a record of commissions due.

- ① Each insurance policy sold by Jack Harris during this period is listed.
- ② Insurance premiums can be paid by policyholders in several ways.

③ Salesmen receive commissions both on new policies and on renewals of policies sold in previous years. The renewal commission is a much smaller percentage of the premium.

④ The sum of the first year and the renewal commissions is the total amount due the salesman.

⑤ Since a premium cheque for \$60.94 was paid directly to Mr. Harris from a policyholder, this amount is deducted from the total commission.

⑥ A cheque to Mr. Harris for this amount accompanies the statement.

Harrington Life Insurance Company 95 Kensington • Winnipeg • Manitoba

COMMISSION EMPLOYEE'S NAME & ADDRESS			COMMISSION STATEMENT			IDENTIFICATION NUMBER		COMMISSION EARNINGS FOR PERIOD ENDING	
Jack P. Harris 477 Homewood Drive Regina, Sask.			STATEMENT OF EARNED COMMISSIONS, AND CHECKS RECEIVED BASED ON PREMIUMS RECEIVED DURING PERIOD.			796 9133		31/3/76	
1. POLICY OR CHECK NUMBER	2. POLICY HOLDER'S LAST NAME	3. DATE OF PAYMENT	4. GROSS PREMIUM RECEIVED	5. FIRST YEAR COMMISSION	6. RENEWAL COMMISSION	7. PAYMENTS RECEIVED BY AGENT (SEE CODE COL. 3)			
BALANCE DUE COMPANY, IF ANY, BROUGHT FORWARD FROM LAST STATEMENT →									
4 115 114	Hyson	② → 2	\$131 99	\$72 59					
7 381 732	Stager	4	148 98	74 49					
3 123 859	Potter	2	259 28		\$7 78				
4 287 880	McNeill	0	9 39	5 16					
4 870 818	Hane	5	60 94		3 05	\$60 94			
7 547 066	Brooks	4	173 47	86 74					
1 795 556	Johnson	1	720 30	432 18					
TOTALS			\$1504 35	\$671 16	\$10 83	\$60 94			
AGENT'S COPY			AMOUNT OF CHECK →			\$621 05			
			OR BALANCE DUE COMPANY IF "CR" SYMBOL APPEARS AT RIGHT						

SPECIAL INSTRUCTIONS AND EXPLANATIONS

1. COLUMN NO. 3 CODE KEY

1 Annual
2 Semi-Annual
3 Quarterly
4 Monthly
5 Check Handed to Agent
6 Commission Deducted from premium by agent
7 Misc. Charges

2. Amount of Commission check is result of adding total of Column No. 5 and Column No. 6 then subtract total of Column No. 7

3. That one extra call that little extra effort each day may be the difference between success and failure and will also greatly affect the size of the plus figure

HERE

EXAMPLE

Samantha is a saleslady in a boutique. Her weekly quota is \$600. She receives a commission of 3% on all her sales over the quota. Her total sales for the last week in May were \$1275.30. Find her commission for the week.

Find the amount of the sales over the quota.

$$\$1275.30 - \$600.00 = \$675.30$$

Multiply by the commission rate.

$$\$675.30 \times 0.03 = \$20.26$$

- Her commission for the week was \$20.26.

EXAMPLE

Brent is a salesman in a bicycle store. His quota is \$550 per week. If he makes his quota, he receives a $2\frac{1}{2}\%$ commission on everything he has sold during the week. His sales for the last week of July were \$795. Find his commission for the week.

Multiply by the commission rate.

$$\$785 \times 0.025 = \$19.63$$

- His commission for the week was \$19.63.

Discussion Question: How else can you be paid? For what kind of work?

Consider: Annual salary; tips – waitresses, barbers, beauty operators, cab drivers; fees – doctors, lawyers, barbers, and so on.

EXERCISES Find the commissions earned by these salespeople. These are the various commission plans.

- Plan I: No quota. Commission is paid on all sales.
Plan II: Commission is paid only on sales over the quota.
Plan III: Commission is paid on all sales if the quota is made.

SALESPERSON	SALES	QUOTA	COMMISSION RATE	PLAN	
1. Flora	\$625.34	none	3%	I	\$18.76
2. Rex	\$740.85	\$550	4%	III	\$29.63
3. Yolanda	\$416.84	\$500	3%	II	none
4. Marshall	\$699.36	\$450	4%	III	\$27.97
5. Sandra	\$451.02	none	3%	I	\$13.53
6. Chauncey	\$928.59	\$600	4%	II	\$13.14
7. Harold	\$874.27	\$500	3%	II	\$11.23
8. Neal	\$975.36	\$550	3%	II	\$12.76
9. Victoria	\$583.19	\$550	3%	II	\$1.00
10. Todd	\$477.89	\$500	4%	II	none
11. Maisie	\$733.76	\$525	3%	III	\$22.01
12. Irwin	\$548.39	\$600	4%	III	none
13. Sebastian	\$1047.21	\$750	$3\frac{1}{2}\%$	II	\$10.40
14. Janice	\$1233.26	\$800	4%	II	\$17.33
15. Lambert	\$1173.77	\$850	5%	II	\$16.19
16. Gifford	\$1836.22	\$1000	5%	III	\$91.81

18 e / CANADA PENSION PLAN

Be sure to tell students of any recent changes in contribution rates or in the maximum allowable deduction.

Point out that the self-employed person is both an employer and an employee.

Obtain the latest free pamphlets from your district taxation office.

If you are salaried or a wage earner, your employer is required, by law, to make certain deductions for Income Tax, Canada Pension Plan, Unemployment Insurance, and Hospital Insurance, with only a few exceptions. Other optional deductions might be union dues, charitable donations, and savings bonds.

The Canada Pension Plan was put into effect in January, 1966 and is compulsory for workers between 18 and 70 years who earn a minimum of \$700 per year. The amount that is paid into the fund is equal to 3.6% of your annual salary up to a maximum of \$6600. The 3.6% contribution is divided into two, so that you only pay 1.8% and your employer pays the other 1.8%. Thus, a person who earns \$6600 and another who earns \$7500 will both make an equal contribution. The money that is accumulated in the plan is invested and paid out to the people retiring over the age of 65.

The employee's portion of the Canada Pension Plan is deducted by the employer at each pay period. The amount deducted is based upon his gross salary and is obtained by using a table supplied by the federal government. The maximum a person can pay into the fund in one year is \$106.20 based on \$6600, less \$700, times 1.8%. Contribution tables are available to determine the amount to be deducted. If greater deductions are made then are necessary, you can claim a refund at the end of the year when filing an income tax return.

CANADA PENSION PLAN CONTRIBUTIONS AND UNEMPLOYMENT INSURANCE PREMIUMS

COTISATIONS AU RÉGIME DE PENSIONS DU CANADA ET PRIMES D'ASSURANCE-CHÔMAGE

WEEKLY PAY PERIOD — PÉRIODE HEBDOMADAIRE DE PAIE

\$133.19 — \$518.17

Remuneration Rémunération		C.P.P. R.P.C.	U.I. Premium Prime d'a.-c.		Remuneration Rémunération		C.P.P. R.P.C.	U.I. Premium Prime d'a.-c.		Remuneration Rémunération		C.P.P. R.P.C.	U.I. Premium Prime d'a.-c.	
From-de	To-à		Regular Ordinaire	Reduced Réduite	From-de	To-à		Regular Ordinaire	Reduced Réduite	From-de	To-à		Regular Ordinaire	Reduced Réduite
\$ 133.19	\$ 133.73	2.16	1.87	1.49	\$ 173.19	\$ 173.73	2.88	2.38	1.90	\$ 213.19	\$ 218.17	3.64	2.38	1.90
133.74	134.29	2.17	1.88	1.50	173.74	174.29	2.89	2.38	1.90	218.18	223.18	3.73	2.38	1.90
134.30	134.84	2.18	1.88	1.51	174.30	174.84	2.90	2.38	1.90	223.19	228.17	3.82	2.38	1.90
134.85	135.40	2.19	1.89	1.51	174.85	175.40	2.91	2.38	1.90	228.18	233.18	3.91	2.38	1.90
135.41	135.95	2.20	1.90	1.52	175.41	175.95	2.92	2.38	1.90	233.19	238.17	4.00	2.38	1.90
135.96	136.51	2.21	1.91	1.53	175.96	176.51	2.93	2.38	1.90	238.18	243.18	4.09	2.38	1.90
136.52	137.07	2.22	1.92	1.53	176.52	177.07	2.94	2.38	1.90	243.19	248.17	4.18	2.38	1.90
137.08	137.62	2.23	1.92	1.54	177.08	177.62	2.95	2.38	1.90	248.18	253.18	4.27	2.38	1.90
137.63	138.18	2.24	1.93	1.54	177.63	178.18	2.96	2.38	1.90	253.19	258.17	4.36	2.38	1.90

table 18.2

EXAMPLE

In 1974, Jeffery earned \$135 per week. Find out how much was deducted for Canada Pension Plan. How much would the employer have to pay into the fund? (See table 18.2)

- \$135 lies within the range of \$134.85 and \$135.40 in the remuneration column. Jeffery would have deducted from his pay \$2.19. (See table 18.2)
- The employer would have to pay an equal amount, i.e. \$2.19.

Point out that tables shows deductions for wages, salaries paid weekly, bi-weekly, monthly, etc.

Be sure each student has a current copy of the tables.

EXAMPLE

Arthur works for the Towner Shoe Store and earns \$174.65 per week. How much would be deducted for Canada Pension Plan? (See table 18.2)

- Arthur would have to pay \$2.90.

EXAMPLE

Rodney works for A & B Record Shop and earns \$216 per week. How much would be deducted for Canada Pension Plan? (See table 18.2)

- Rodney would have to pay \$3.64.

EXERCISES Find the amount deducted from each paycheck for Canada Pension Plan*.
(See the tables in the appendix)

1. \$115 per week **\$1.83**
3. \$221 per week **\$3.73**
5. \$975 per month **\$16.50**
7. \$482 every 2 weeks **\$8.19**
9. \$195 per week **\$3.27**

2. \$1110 per month **\$18.94**
4. \$625 every 2 weeks **\$10.75**
6. \$215 per week **\$3.64**
8. \$1200 per month **\$20.74**
10. \$1485 per month **\$25.87**

*answers based on 1974 tables

18 f / UNEMPLOYMENT AND HEALTH INSURANCE

Unemployment Insurance is a premium paid into a government fund so that benefits, i.e. a living wage, may be drawn by an eligible employee who is out of work. The laws and regulations pertaining to unemployment insurance are made by the federal government.

Benefits vary according to provinces, according to earnings, and according to the period of contributions.

The maximum benefit could be as high as \$170 per week and is based on $66\frac{2}{3}\%$ of the previous week's wages. After paying into the fund for 8 weeks during a 52-week period, a person is entitled to receive Unemployment Insurance for a period of 52 weeks. Any employee, including students, who earns over \$34 per week must contribute to the fund.

The law requires that employers deduct an amount equal to 1.4% of their employees' gross earnings at each pay period. Deductions are only made when an employee has the minimum earnings according to table 18.3 and cease at a maximum earnings according to table 18.3.

However, these deductions need not be calculated and are made according to a table supplied. See table on page 230. Employers must then contribute 1.4 times as much as the employee.

Although there are two rates, all examples and exercises are calculated on regular rate. Reduced rate is paid by employees in "secure" jobs, e.g. teachers.

Project: Talk to someone who has been paid unemployment insurance. How long did it take before benefits were paid? How much was paid? For how long?

EXAMPLE

Jeffery earned \$135 per week. What amount would the employer deduct for Unemployment Insurance?

If we had no tables— $\$135 \times 1.4/100 = \1.89

As per table 18.2, between \$134.85 and \$135.40 Unemployment Insurance premium is \$1.89.

What would employer contribution be?

■ $1.4 \times \$1.89 = \2.64

SCHEDULE OF MINIMUM AND MAXIMUM INSURABLE EARNINGS FOR VARIOUS PAY PERIODS
TABLEAU DU MINIMUM ET DU MAXIMUM DE LA RÉMUNÉRATION ASSURABLE
POUR DIVERSES PÉRIODES DE PAYE

Pay Period Période de paie	Minimum				Maximum
	Nfld. and P.E.I. T.-N. et Î.-P.-É.	New Brunswick Nouveau-Brunswick	Nova Scotia Nouvelle-Écosse	Other Provinces and Territories Autres provinces et territoires	All Provinces and Territories Toutes les provinces et tous les territoires
Weekly—Hebdomadaire	\$ 28.00	\$ 30.00	\$ 33.00	\$ 34.00	\$170.00
Bi-Weekly—Quinzaine	56.00	60.00	66.00	68.00	340.00
Semi-Monthly—Bi-mensuelle	60.67	65.00	71.50	73.67	368.33
Monthly—Mensuelle	121.33	130.00	143.00	147.33	736.67
10 Monthly—10 mensuelles	145.60	156.00	171.60	176.80	884.00
13 Pay Periods—13 périodes de paie	112.00	120.00	132.00	136.00	680.00
22 Pay Periods—22 périodes de paie	66.10	70.91	78.00	80.36	401.82

table 18.3

HEALTH INSURANCE

Today, most provincial governments offer some form of health insurance protection. For example, in Ontario the Ontario Health Insurance Commission has a plan which covers the cost of medical care and standard ward accommodation in a hospital. If a company has 15 or more employees, the health insurance premiums must be deducted from the employees' wages. The rates are \$11 per month, or approximately \$2.50 per week, for a single person, and \$22 per month, or approximately \$5.00 per week, for a family. The family rate covers all unmarried and unemployed children under 21. Persons who are not covered as members of employee groups may pay direct at a quarterly rate of \$33 per single person or \$66 quarterly for a family.

EXAMPLE

Jonathon, a married man with two children, works for a large packaging company. He has health insurance premiums deducted from his weekly wages. How much would the health insurance deductions be?

- The weekly health insurance deductions would be approximately \$5.00.

EXERCISES Using the table obtained for the exercises involving Canada Pension Plan deductions find the Unemployment Insurance premiums for each employee's pay period.
(Note: these answers are based on 1974 Ontario tables, using regular deductions.)

WORKER	GROSS WAGES	PAY PERIOD
1. Bennett	\$75.00 a week	weekly \$1.05
2. Blanche	\$100.00 a week	weekly \$1.40
3. Clare	\$125.00 a week	weekly \$1.75
4. Hedda	\$150.00 a week	weekly \$2.10
5. Brian	\$102.65 a week	weekly \$1.44
6. Christine	\$105.93 a week	weekly \$1.48
7. Owen	\$121.56 a week	weekly \$1.71
8. Irene	\$143.75 a week	weekly \$2.02
9. Peter	\$175.30 a week	weekly \$2.38
10. Donald	\$212.70 a week	weekly \$2.38

18 g / INCOME TAX DEDUCTIONS

Stress that income tax withholding deductions are credits to be used at the end of the year when the taxes are due. Show how tax refunds are received by some taxpayers.

The largest deduction from your paycheque is for income taxes. The amount deducted is determined by your wages or salary, your marital status, and the number of your exemptions. An exemption is a form of tax free money allowed by the government to workers to help support his dependents.

An employer is required by law to deduct and remit income tax installments for the employee, reducing the burden of paying a large sum at the year end.

On commencing employment, all employees must complete a form called a TD1. On this form, he makes claims for the various exemptions which he is allowed. His personal exemption is \$1706. If married, he is allowed a further exemption of \$1492, if his wife's income was not over \$314. A claim for additional exemptions can be made for \$320 for those children under 16 years of age and \$586 for those over 16 years of age.

There are additional exemptions available, such as a further \$1066 is granted to persons over 65 years and special exemptions for students and part-time employees.

The employer makes deductions from each pay period. Tables are used to determine these deductions.

Have students contact the nearest taxation office and obtain copies of the Income Tax Tables.



To use the tables, you have to know the employee's weekly, monthly, etc. wages, his marital status, and his exemptions. This information is obtained from a TD1 form which the employee is required, by law, to file with his employer.

It is important to note that before deducting tax from the employee's gross earnings, the employer must first take off all contributions to the Canada Pension Plan and Unemployment Insurance Commission.

EXAMPLE

Jeffery is single and earns \$135 per week. Find the amount of income tax withholding deductions for one week.

First deduct Canada Pension and Unemployment Insurance (see table 18.2).

C.P.P. = \$2.19

U.I. (regular) = \$1.89

\$2.19 + \$1.89 = \$4.08

Deduct \$4.08 From Jeffery's gross wages.

\$135.00 - \$4.08 = \$130.92

Now see table in appendix for \$130.92 under exemption column (1)—since Jeffery is single his exemption is \$1706.

- Income tax deducted is \$21.25.

EXAMPLE

Arthur is married and earns \$225 per week. His wife does not work and earns no income. He has two children, one age 7, and the other, age 11. Find the amount of income tax withholding deductions for one week.

Exemptions = \$1706	— Arthur
1492	— wife
628	— 2 children
<u>\$3826</u>	

First deduct Canada Pension and Unemployment Insurance (see table 18.2).

Canada Pension	= \$3.82
Unemployment Insurance =	<u>2.38</u>
	<u>\$6.20</u>

Deduct \$6.20 from Arthur's gross earnings.

$$\$225.00 - \$6.20 = \$218.80$$

Now see table in appendix for \$218.80 under exemption column (12).

- Income tax withholding deductions are \$34.30.

EXERCISES Find the withholding income tax deductions for these employees for one week.

(The answers are based on tables for 1974. They will vary depending on what tables the students are using)

EMPLOYEE	MARITAL STATUS	DEPENDENTS	WEEKLY WAGE	EXEMPTION	C.P.P.* & U.I.	TAX
1. Olga	single	—	\$115	\$1706	\$1.83 1.61 <u>\$3.44</u>	\$15.75
2. Joan	single	—	\$124	\$1706	\$1.99 1.74 <u>\$3.73</u>	\$18.50
3. Debra	married	none—husband works	\$110	\$1706	\$1.74 1.54 <u>\$3.28</u>	\$14.65
4. Mary	single	—	\$145	\$1706	\$2.37 2.03 <u>\$4.40</u>	\$24.00
5. Roy	married	1—wife not working	\$195	\$3198	\$3.27 2.38 <u>\$5.65</u>	\$28.75
6. James	married	2—wife & 3-year-old son	\$210	\$3518	\$3.54 2.38 <u>\$5.92</u>	\$32.10
7. Leon	married	3—wife & 17-year-old & 12-year-old children	\$230	\$4140	\$3.91 2.38 <u>\$6.29</u>	\$34.10
8. Pat	single	—	\$160	\$1706	\$2.64 2.24 <u>\$4.88</u>	\$28.20

*Answers based on tables in appendix.

18 h / PREPARING THE PAYROLL

Discussion Question: What kind of precautions should a worker take after receiving his paycheck?

Consider: Budgeting his money to pay bills; savings plans; special retirement programs; special medical prepayment plans; insurance to protect his family; and so on.

Large organizations use computers to compute the payroll. Some computers even print the payroll cheques and calculate all the deductions at the same time. This does not mean that people have no control over the payroll. On the contrary, someone must program the computer.

The payroll accountant must keep payroll records for every employee. From these records, the payroll accountant prepared the payroll.

EXAMPLE

Compute the net pay (take-home pay) for Roger F. Bradshaw for the first week in March, 1974.

Roger's Employee's Earnings Record is as follows:

EMPLOYEE'S EARNING RECORD								
Number	106	Date employed	January 9, 1973					
Name	Roger F. Bradshaw	Marital Status	Single					
Address	15 Birdsall Ave., Toronto	Income tax exemption	\$1706					
		Social Insurance No.	263-416-789					
Week Ending	Pay Rate (per hour)	Gross Pay	Canada Pension	Unemployment Ins.	Income Tax	Health Insurance	Union Dues	Net Pay
7/3	\$4.40	\$176.00	\$2.93	\$2.38	\$33.45	\$2.50	\$1.10	\$133.64

Gross pay is \$176.00. First deduct Canada Pension and Unemployment Insurance (see table 18.2).

$$\begin{array}{rcl} \text{Canada Pension} & = & \$2.93 \\ \text{Unemployment Insurance} & = & 2.38 \\ & & \underline{\$5.31} \end{array}$$

$$\text{Gross pay } \$176.00 - \$5.31 = \$170.69$$

Since Roger is single, see Income Tax Table in appendix, exemption column (1).

$$\begin{array}{rcl} \text{Income Tax deductions} & = & \$33.45 \\ \text{Hospital Insurance} & = & 2.50 \\ \text{Union Dues} & = & 1.10 \\ & & \underline{\$37.05} \end{array}$$

$$\text{Total Deductions } (\$5.31 + \$37.05) = \$42.36$$

$$\text{Gross Pay} - \text{Total Deductions} = \text{Net Pay}$$

$$\$176.00 - \$42.36 = \$133.64$$

- Roger's net pay (take-home pay) is \$133.64.

FACTS & FIGURES

All across the United States, big cities are mired in the worst fiscal crisis they have faced since the Depression.

To make ends meet, Detroit plans to drop about 3,500 of its 22,000 full-time municipal employees. Atlanta's city council ordered a five-day unpaid vacation for all of its workers. Cleveland's garbage is now collected only every other week. These cities' problems seem picayune, however, when compared to those of New York. Despite various economies ordered by Mayor Abraham Beame, the city is so desperately short of money that it may have to default on some of its debt obligations. Between May 31 and June 11, \$1.6-billion in short-term loans will mature that the city must legally pay off.

New York is in a bind for a number of reasons, not least of which is the extraordinary array of public services it offers its resident. The City University of New York "is bigger than the universities of 43 states", Business Week observed. "New York City operates 19 public hospitals. The nation's second largest city, Chicago, has only one. If New York were to pay for welfare and social services at the same rate as Los Angeles, the bill would come to \$125-million instead of the actual \$2-billion annually."

Fact and Figures

If a city or province in Canada went bankrupt, how could this affect you, the resident?

Do any Canadian cities seem to be in danger of this type of economic crisis?

EXERCISES Compute the net pay for each employee of the Kwik-Stik Glue Company for the last week of January, 1974. All employees have health insurance deductions made. These answers are calculated from the tables in the appendix. [See answers at back of book.](#)

EMPLOYEE	MARITAL STATUS	DEPENDENTS	HOURLY RATE	HOURS WORKED		OTHER WEEKLY DEDUCTIONS
				REG./O.	TIME	
1. Harvey	single	—	\$2.90	40	—	Union \$2.20
2. Edna	married	none—husband works	\$3.20	40	—	Group Insurance \$2.10
3. Ralph	married	1 wife not working no income	\$3.65	40	—	Donations \$1.00
4. Erin	single	—	\$3.10	40	4	—
5. Sam	married	2 wife plus one child (5 years old)	\$4.80	40	6	—

REVIEW / THE PAYCHEQUE

CHECKLIST

Canada Pension Plan (p. 230)
Commission (p. 226)
Employer's tax rate (p. 232)
Exemption (p. 234)
Gross wages (p. 222)
Health Insurance (p. 233)
Hourly wages (p. 222)
Income tax withholding (p. 234)
Overtime (p. 222)
Paycheque (p. 221)
Payroll deduction (p. 233)
Piece-rate (p. 224)
Regular time (p. 222)
Salary (p. 228)
Sales (p. 228)
Sales quota (p. 228)
Straight commission (p. 226)
Time-and-one-half (p. 222)
Unemployment Insurance (p. 232)
Union dues (p. 236)
Wages (p. 222)

PROBLEMS

In problems 1 through 6, find the gross earnings for these employees.

1. Arnold worked 40 hours at \$1.95 an hour. **\$78.00**
2. Elvira worked 30 hours at \$1.82 an hour. **\$54.60**
3. Patrick worked 40 hours regular time at \$2.45 an hour and 6 hours overtime at \$3.675 an hour. **\$120.05**
4. Willard worked 40 hours regular time at \$2.98 an hour and 8 hours overtime at \$4.47 an hour. **\$154.96**
5. Bertram worked 40 hours regular time at \$2.44 an hour and 9 hours overtime at time-and-one-half regular time. **\$130.54**
6. Mamie worked 40 hours regular time at \$2.38 an hour and 7 hours overtime at time-and-one-half. **\$120.19**

In problems 7 through 12, find the gross earnings for these piece-rate workers.

7. Charlene dresses dolls at the toy factory. She receives \$0.065 per doll. During the week, she dressed 1000 dolls. **\$65.00**

8. Virgil addresses envelopes for a direct mail advertising firm. He receives \$0.0275 per envelope. During the week, he addressed 2550 envelopes. **\$70.13**
9. Olaf dips printed circuits in an electronics factory. He receives \$0.1425 per circuit. During the week, he dipped 588 circuits. **\$83.79**
10. Irma hand packs stainless steel flatware in gift sets. She receives \$0.225 per box. During the week, she packed 382 boxes. **\$85.95**
11. Ted hand paints chinaware in a porcelain factory. He receives \$0.75 per plate. During the week, he painted 233 plates. **\$174.75**
12. Rebecca hand packs dried fruits in gift baskets. She receives \$0.375 per basket. During the week, she packed 198 baskets. **\$74.25**

In problems 13 through 18, find the commissions earned by these salespeople.

13. Kenneth sells brushes from door to door on a straight commission basis of 40%. During the last week in September, his sales were \$425.36. **\$170.14**
14. Sheila sells cosmetics from door to door. She receives a straight commission of 50%. During the first week in December, her sales were \$255.88. **\$127.94**
15. Francis works for a salary and also receives a commission of 5% of everything that he sells. The second week in August, his sales were \$1486.30. **\$74.32**
16. Karen works for a salary and receives 4% of everything sold above her quota of \$550 per week. The third week in March, her sales were \$974.44. **\$16.98**
17. Dudley is a life insurance salesman. His commission on the first-year paid premium for ordinary life is 55%. During the month of February, his first-year paid premiums for ordinary life were \$960.50. **\$528.28**
18. Daphne sells real estate. She receives a straight commission of 3% of her sales. During the month of July, she sold farm acreage for \$29 500 and a resort cottage for \$15 750. **\$1357.50**

In problems 19 through 24, find the Canada Pension deduction from each paycheque. (Use tables in appendix.)

19. Leonard earned \$234.40 during the first week of March, 1974. **\$4.00**

20. Glen earned \$135 during the first week in February, 1974. **\$2.19**
21. Isaac is paid \$208 per week. Find his deduction for the last week of December. **\$3.50**
22. Lena earns \$157.50 per week. **\$2.59**
23. Michael receives a wage of \$246 a week. **\$4.18**
24. Edward earns \$187.46 for the second week in May, 1974. **\$3.13**
25. Find the Unemployment Insurance premiums for problems 19-24. Use table in appendix. Make regular deductions.

19. \$2.38	20. \$1.89	21. \$2.38
22. \$2.20	23. \$2.38	24. \$2.38
26. Given the following additional information, find the income tax withholding for problems 19-24. (Use table in appendix.) In each case, calculate the total exemptions.

19. Leonard is single. \$1706-\$51.20
20. Glen is married. His wife does not work. \$3198-\$12.85
21. Isaac is married, and has a 7-year-old child. \$3518-\$32.10
22. Lena is single. \$1706-\$27.60
23. Michael is married. He and his wife have two children, one age 6, the other age 17. \$4104-\$38.80
24. Edward is married. His wife does not work. \$3198-\$27.25
25. Using the weekly wages and the Canada Pension Plan contributions calculated in problems 19-24, the Unemployment Insurance premiums in Problem 25, and the Income Tax withholding in Problem 26, prepare the weekly payroll for Off-Beat Productions Limited for the last week in July, 1974. All employees pay union dues of \$1.25. **Answer in back of book.**

QUESTIONS

1. What are the different ways in which employees are paid?
2. How many hours are in the standard work week?
3. What constitutes overtime?
4. How is overtime usually paid?
5. What are the advantages and disadvantages of the piece-rate system?
6. What occupation is most closely associated with commissions?
7. What is straight commission?
8. What are the advantages and disadvantages of a commission job?
9. What are the most common payroll deductions?
10. What determines the amount of payroll deductions for income tax purposes?
11. What is a TD1 form used for?

Research/Discuss

- ☐ Discussion should bring out the following: the government would have to be reorganized, programs would have to be eliminated, millions of federal employees would be released from their jobs, the armed forces would be drastically reduced, all federal expenditures would have to be reduced or eliminated, and, perhaps the federal debt or a portion of it would be repudiated. The prospects of eliminating any tax, once it

CHAPTER 19

is established are quite remote.

- ☐ Actually, they do, because the property taxes paid by the owner of the property are collected from the tenants in the form of higher rents.
- ☐ For operating local government services such as schools, fire and police protection, parks and playgrounds, and so on.
- ☐ No, it is a greater burden in the lower income brackets. Any given amount of tax paid represents a higher percentage of a lower income than it does of a higher income. Such a tax is called regressive.
- ☐ Because a sales tax is a regressive tax, the federal government prefers to use income tax, which is a progressive tax. With income tax, higher incomes are taxed at a higher rate than lower incomes.

TAXES

RESEARCH/DISCUSS

- ☐ What would happen if the income tax laws were revoked?
- ☐ Do people who rent their homes pay property taxes?
- ☐ What are property tax funds used for?
- ☐ Does a sales tax impose the same tax burden on a person in the lower income brackets as a person in the higher income brackets?
- ☐ The federal government has a huge deficit. Why doesn't it enact a sales tax to increase revenue?

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ how to compute property taxes
- ☐ what expenditures can be deducted from your income for tax purposes
- ☐ how to use the various income tax tables
- ☐ how to compute your income tax
- ☐ about sales tax

19 a / PROPERTY TAXES

Real property refers to both land and any building on the land. *Personal property* is any property other than real property. Owners of real and personal property are taxed on the basis of the value of the property.

- The *market value* is the price the owner could expect to get if the property is sold.
- The *assessed value* is the value of the property used for tax purposes.



The assessed value is some fraction or percent of the market value. This fraction depends on local practices and prevailing laws. It varies from about $\frac{1}{6}$ to $\frac{1}{3}$ of the market value. This means that the owner of a \$30 000 home may find that his home has an assessed value from \$5000 to \$10 000.

Property tax rates are fixed by local governments. Businessmen, when making budgetary plans, estimate their income and then plan their expenses and profits accordingly. Governmental bodies, when making budgetary plans, reverse the procedure. They plan expenses first, and then set the tax rate to raise the revenue for the expenses. In order to set the tax rate, the taxing authority must know the total assessed valuation of all taxable property. The budgeted expenses are then divided by the total assessed value and multiplied by 1000. The quotient is the tax rate expressed on the basis of mills on the dollar.

The amount of property tax paid depends on both the assessed value and the tax rate. A change in either or both will affect the amount of tax paid.

$$\text{Mill rate} = \frac{\text{Budgeted expenses}}{\text{Total assessed value}} \times 1000$$

Using this method, property taxes are levied in proportion to the assessed value of the property.

EXAMPLE

The total assessed value in Utopia municipality is \$750,386,000. The municipal council approves a budget to spend \$703,300,000 during the year. Find the mill rate necessary to produce the required revenue.

Project: Find out what the mill rate is for your local government.

Divide budget expenses by the total assessed value.

$$\frac{\$70\,300\,000}{\$750\,386\,000} \times \frac{1000}{1} = 93.7$$

- The necessary mill rate is 93.7 mills per dollar assessed.

NOTICE OF ASSESSMENT

THIS IS NOT A TAX BILL

WARD 09

MADE IN 1972 FOR TAXATION YEAR 19 73

TAKE NOTICE THAT YOU ARE ASSESSED FOR TAXATION AS SPECIFIED BELOW. IF YOU DEEM YOURSELF IMPROPERLY ASSESSED IN ANY RESPECT YOU OR YOUR AGENT MAY APPEAL ON OR BEFORE THE DATE SPECIFIED. NOTIFY THE UNDERSIGNED IN WRITING OF YOUR COMPLAINT AND IT WILL BE TRIED BY THE ASSESSMENT REVIEW COURT.

SEE REVERSE SIDE FOR: (I) APPEAL PROCEDURES (II) CODES USED ON NOTICE		PARTICULARS OF PERSONS ASSESSED									
MUNICIPALITY NORTH YORK		NAMES AND ADDRESSES OF OWNERS, LESSEES, TENANTS & OCCUPIERS			MARITAL STATUS	CITIZENSHIP STATUS	RELIGION	OCCUPATION	YEAR OF BIRTH	SCHL. SUP.	CORPORATION
SIGNED ASSESSMENT COMMISSIONER R. J. GUINN 55 DONCASTER AVE. WILLOWDALE		CAMPBELL, SCOTT CAMPBELL, MAUREEN 92 WOOD AVENUE WILLOWDALE			M M W	O O	P H W	TEACHER	26 23	P P	
PROP. NO. 092 510 01800	YOU ARE ASSESSED AS A PUBLIC	SCHOOL SUPPORTER			THIS ASSESSMENT IS CLASSIFIED AS						
DESCRIPTION OF PROPERTY ASSESSED (PLAN OR CONCESSION, LOT NUMBER)		OCCUPANTS PORTION	TOTAL REAL PROPERTY	LIABLE FOR TAX RATE	LAST DAY FOR APPEAL						
92 WOOD AVENUE, WILLOWDALE				RP 6085	15 APR 7 2						
1801 E 42FT 273		T 6085	T 6085	CP	DATE MAILED						
42.000FR		E		CS	17 MAR 7 2						
		ET		BP	BUSINESS PERCENTAGE						
				BS							

NOTE: WHERE PROPERTY IS OCCUPIED BY A TENANT, TAXATION FOR SCHOOL PURPOSES IS DETERMINED ACCORDINGLY AS THE TENANT IS ASSESSED FOR SCHOOL SUPPORT.

Several months before receiving a tax bill, property owners in many provinces receive an assessment notice. The notice states the assessed value of their property, as recorded in the assessor's office.

① Property usually has an official description that is different from its street address.

② The lot has been valued at \$6085 for assessment purposes.

③ Mr. Campbell, the property owner, must appeal this notice by the last day for appeal if he feels any error has the assessment is too high.

EXERCISES Find the property tax mill rate for each budgeted expense and total assessed value.

BUDGETED EXPENSES	TOTAL ASSESSED VALUE		BUDGETED EXPENSES	TOTAL ASSESSED VALUE	
1. \$1 340 000	\$20 350 000	65.8	2. \$2 526 000	\$34 415 000	73.4
3. \$3 150 000	\$50 100 000	62.9	4. \$4 228 000	\$64 549 000	65.5
5. \$5 369 000	\$70 724 000	75.9	6. \$6 562 000	\$78 725 000	83.4
7. \$7 546 000	\$83 456 000	90.4	8. \$8 147 000	\$90 247 000	90.3
9. \$9 215 000	\$89 389 000	103.1	10. \$10 674 000	\$104 274 000	102.4
11. \$11 742 000	\$109 148 000	107.6	12. \$12 431 000	\$115 753 000	107.4
13. \$13 975 000	\$234 649 000	59.6	14. \$14 243 000	\$257 359 000	55.3
15. \$15 848 000	\$225 583 000	70.3	16. \$16 293 000	\$200 537 000	81.2

19 b / THE PROPERTY TAX BILL

After the mill rate has been set by the taxing authority, tax bills are computed from official records of each property's assessed value. The amount of the tax is found by multiplying the assessed value by the tax rate.

$$\text{Tax} = \text{Assessed value} \times \text{Mill rate}$$

Project: Find out the total assessed valuation of your municipality from the municipal assessor. Determine the maximum property tax revenue for your municipality.

EXAMPLE

Find the tax bill if the assessed value is \$6000 and the mill rate is 82.05.

Multiply the assessed value by the mill rate. The mill rate is expressed on the basis of mill on the dollar. 82.05 can be written as 0.08205.

$$\$6000 \times 0.08205 = \$492.30$$

- The tax bill is \$492.30.

TAXES	GENERAL	EDUCATION	LOCAL IMPROV.	WEED CUTTING	MISC.	TOTAL TAX	LESS INTERIM BILL
ASSESSMENT	TOTAL ASSESSMENT	TAXABLE AT RESIDENTIAL RATES		TAXABLE AT COMMERCIAL RATES		SUPPLY/TRY MO	TOTAL THIS BILL
	6085	PUBLIC SCHOOL	SEPARATE SCHOOL	PUBLIC SCHOOL	SEPARATE SCHOOL	REAL. AMEND.	594

BOROUGH OF NORTH YORK 1974 REALTY TAX BILL

ASSESSMENT ROLL NUMBER			
MAP	DIV.	SUB. DIV.	PARCEL
9	2	510	01800

PERSON ASSESSED

Campbell, Scott
Campbell, Maureen
92 Wood Avenue
Willowdale, Ontario.

MORTGAGE NUMBER	
042	1182218

LOCATION

4 TH INSTAL	DUE DATE	AMOUNT
	21 Aug	99.00

5 TH INSTAL	DUE DATE	AMOUNT
	21 Sept	99.00

6 TH INSTAL	DUE DATE	AMOUNT
	16 Nov	99.00

After sending out assessment notices and setting the mill rate, the Assessor's office sends out the tax bills.

The tax bill can be paid in six installments, the last three as shown on the above tax bill. The last three installments would be paid in August, September and

November.

The total tax for the year would be \$594. The assessed value is \$6085. Therefore, the mill rate is 97.62.

If the bill is not paid promptly, penalties are added.

Revenu Canada
TaxationRevenu Canada
Impôt

EMPLOYEE'S TAX DEDUCTION RETURN

TD 1
Rev. 1974

• Complete and file one copy of this return with your employer

- (a) when you commence employment, or (b) within seven days of any change affecting your personal exemptions
- If you do not file this return, as required, income tax will be deducted as though you were a single person without dependants.
- Do not claim a child or other dependent whose net income for the year will exceed \$1,806
- Net income of your spouse or dependants includes any pension or supplement under the Old Age Security Act or any similar Act of a province, benefits under the Canada or Quebec Pension Plan or the Unemployment Insurance Act, 1971.

FAMILY OR LAST NAME (Print)

CARON

USUAL FIRST NAME AND INITIALS

PAUL

SOCIAL INSURANCE NUMBER

237169864

PRESENT ADDRESS (Permanent Address)

212 Hammond DR, Mississauga Ontario

DATE OF BIRTH (Day, Month, Year)

23 12 38

NAME AND ADDRESS OF SPOUSE

Claim for Personal Exemptions

Basic Personal Exemption

Age Exemption—If you are 65 years of age or over

Claim \$1,066

Disability Exemption—For blind persons and persons confined throughout the year to a bed or wheel chair

Claim \$1,066

Married or Equivalent Exemption—If applicable, check ☒ and claim only one of these 4 items

If your spouse's net income, while married, will exceed \$1,806 in the year, you may not claim this exemption.

Married and supporting spouse

☐ 1. whose net income for the year, while married, will not be over \$314

Claim \$1,492

☐ 2. whose net income for the year, while married, will be over \$314 but not over \$1,806

\$1,806

Less: spouse's net income \$

Claim \$

\$1492

Single, divorced, separated or widow(er)

Exemption may be claimed for a relative (a) wholly dependent on you or on you and one or more other persons and (b) living in a dwelling (in which you reside) maintained by you or by you and such other persons of whom the dependent is also a relative (You may claim here only if it has been agreed that no other person will claim for the same dependent or in respect of the same dwelling.)

If the dependent's

☐ 3. net income for the year will not be over \$314, provide details below* and claim \$1,492

\$1,806

Less: dependent's net income \$

Provide details below* and claim \$

*Relationship to you

*Dependent's name

Exemption for Wholly Dependent Children

Exemption may be claimed for a wholly dependent son, daughter, grandchild, niece or nephew under age 21 or any age if in full-time attendance at a school or university or infirm. A niece or nephew may be claimed only if (a) you have complete custody and control of the child, or (b) the child resides in Canada and also the mother is a widow or is separated or divorced and does not receive alimony or similar allowance for the child's maintenance, or the father is mentally or physically infirm. Provide details below and claim according to the age and estimated net income of the child, as follows:

Under age 16 at end of the year—If net income will not be over \$1,178, claim \$320 (If net income will be over \$1,178 but not over \$1,806, claim \$320 minus one-half the amount by which income exceeds \$1,178.)

Age 16 or over at end of the year—If net income will not be over \$1,220, claim \$586 (If net income will be over \$1,220 but not over \$1,806, claim \$586 minus the amount by which income exceeds \$1,220.)

No claim may be made here for a child you have claimed in items 3 or 4 above.

Name of child (Attach list if space is insufficient)	Relationship to you	Estimated annual net income	Year of Birth	If over 21, state school attended or whether infirm	
CHRISTOPHER	Son	—	1971	—	\$320
DAVID	Son	—	1973	—	\$320
					\$

Exemption for Other Dependents

(A) Parents, Grandparents, Brothers or Sisters (including in-laws)

(B) Aunts or Uncles Resident in Canada (including in-laws)

Provide details below and claim estimated amount to be spent in support of each dependent (not exceeding the maximum which is determined according to the age and income of the dependent as described in the "Exemption for Wholly Dependent Children" area above). If any other person also contributes to the support of a dependent listed here, the combined amount claimed by you and such other person must not exceed the allowable maximum determined for that dependent. No claim may be made for (a) a dependent over age 21 who is not mentally or physically infirm (unless that dependent is a brother or sister in full-time attendance at a school or university) or (b) a dependent you have claimed in items 3 or 4 above.

Name and address of dependent (Attach list if space is insufficient)	Dependent's Relationship to you	Net income in year	Year of Birth	Estimated amount you will spend in support of dependent	If over 21, state school attended or whether infirm	
						\$
						\$

Student Exemptions

- Enter 950 times the number of months in the year during which you will be a student in full-time attendance at a university or college or an institution offering job retraining courses. Attendance at a secondary school does not qualify.
- Enter the amount by which your tuition fees exceed the total amount (less \$500) of all scholarships, fellowships or bursaries which you will receive during the calendar year.

Total

\$3838

Deduct: Adjustment for Taxable Family Allowance Payments

Enter the amount of taxable Family Allowance payments to be received on account of children claimed above.

\$480

Net Claim—(This entry will not be less than \$1,706)

\$3358

Exemption Claim for Casual, Seasonal or Part-time Employment—(Valid for current calendar year only)

This area must be completed by an employee who is receiving pay at a rate that is subject to tax deduction but who claims a exemption because total earnings (including free board and lodging) from all sources, including taxable Family Allowance payments, for the calendar year will be less than the total claim above. No claim may be made here by a person not resident in Canada for the whole year unless his earnings for the year in Canada will be less than his exemptions apportioned to the period of residence in Canada.

Income to date this year from all sources	—	—	—	—	—	\$
Estimated income for remainder of year from all sources	—	—	—	—	—	\$
Total estimated income from all sources	—	—	—	—	—	\$

Certification

I HEREBY CERTIFY that the information given in this return is true, correct and complete to the best of my knowledge and belief.

Signature P.T. Caron

It is a serious offence to make a false return.

Date 23rd January 1974

Warning: An employer should refer a form TD1 containing doubtful statements to the District Taxation Office. Any person who knowingly accepts a form TD1 containing false or deceptive statements commits a serious offence. Employers must retain completed forms TD1 for inspection by officers of the Department of National Revenue, Taxation. Form authorized and prescribed by the Minister of National Revenue. (Français au verso)

The TD1, as mentioned in Chapter 18, must be filled out by each employee, so that the employer can calculate the amount of income tax deductions that should be made for each pay period.

① Your name, address, and social insurance number are required.

② A list of all your dependents is tabled in order to arrive at your net claim for exemptions.

The principal source of revenue for the Canadian government is income tax. The tax is collected both from individuals and from businesses. Income tax is a *progressive* tax.

People with higher incomes are taxed at a higher rate than people with lower incomes.



In Chapter 18, you learned how to find the amount of income tax withheld from wages each payday. This money is applied toward the actual tax owed. Then, once a year, on or before April 30, every taxpayer files an income tax return with the Revenue Canada, Taxation. This report is for income received during the previous year. If the total amount withheld from paycheques is *less* than the amount owed as computed on the return then the difference must be sent in with the return. But if the total amount withheld from paycheques is *more* than the actual tax, then the Revenue Canada, Taxation will mail a refund for the amount of overpayment.

The amount of tax depends on the amount of taxable income. Taxable income in turn depends upon the amount of net income for tax purposes. The number of exemptions, and the deductions claimed by the taxpayer. Although exemptions and deductions both reduce the amount of tax to be paid, they are not the same.

- An *exemption* is credit for a dependent person.
- A *deduction* is a reduction of the net income for tax purposes.



Certain exemptions and deductions are calculated with reference to a taxpayer's net income for tax purposes. Net income for tax purposes is basically gross income less expenses incurred while earning the income less other specific deductions described in the Income Tax Act.

*An excellent Teacher's Kit on Income Tax is available from
Department of National
Revenue Taxation
Attn: Information Services
875 Heron Road
Ottawa, Ontario
K1A 0L3*

Point out that a student may claim himself as an exemption even though his parents also claim him as an exemption.

CANADIAN IMPERIAL BANK OF COMMERCE

SHERWOOD, MANITOBA

PAY TO THE
ORDER OF

Receiver General of Canada

March 29 1975

\$145.20

— One hundred and forty-five — 20/100 DOLLARS

SAVINGS
ACCOUNT NO.

12890

Fred Ziemilowich

⑆02342⑆010⑆ 00⑆00167⑆

When the total amount withheld from paycheques is more than the actual tax, the taxpayer will receive a cheque from the Department of National Revenue.

When the total amount withheld from paycheques is not equal to the actual tax, the taxpayer will have to make a cheque payable to the Receiver General of Canada to make up for the difference.

Deductions are allowed for certain kinds of expenditures and losses. They fall into several general categories as follows:

- (1) **MEDICAL AND DENTAL EXPENSES.** You may deduct, within certain limits, expenses for
 - Doctors, dentists, and other professional practitioners
 - Drugs or medicines
 - Hospitalization
 - Transportation necessary to get medical care
 - Eyeglasses, artificial teeth, medical braces, and so on
 - X-ray examinations or treatment
- (2) **CONTRIBUTIONS.** You may deduct gifts to many charitable, educational, or non-profit organizations. However, you may not deduct gifts to relatives, friends, social clubs, or labour unions.
- (3) **INTEREST PAID.** You may deduct interest paid on money borrowed to earn income.
- (4) **MISCELLANEOUS DEDUCTIONS.** This is a broad category for all other deductions provided for by the income tax act. Included are:
 - Child care expenses so that you can work
 - Educational expenses necessary for your job
 - Cost of special equipment needed in your job
 - Dues to unions or professional societies
 - Fees to employment agencies
 - Pension plan contributions
 - Unemployment insurance premiums
 - Canada Pension Plan contributions

EXERCISES Find the total amount of money withheld for each employee for the year. Then find the amount of payment or refund.

EMPLOYEE	AMOUNT WITHHELD EACH PAYCHEQUE	PAY PERIOD	ACTUAL TAX
1. Ursula	\$10.50 \$546.00; \$36.37	weekly	\$582.37
2. Gerald	\$12.50 \$650.00; \$21.30 (refund)	weekly	\$628.70
3. Jessie	\$41.17 \$494.04; \$34.08 (refund)	monthly	\$459.96
4. Phyllis	\$68.00 \$816.00; \$56.67	monthly	\$872.67
5. Ashley	\$18.00 \$936.00; \$5.50	weekly	\$941.50
6. Amos	\$31.85 \$764.40; \$7.94	semi-monthly	\$772.34
7. Sander	\$24.27 \$582.48; \$84.87 (refund)	semi-monthly	\$497.61
8. Will	\$22.00 \$1144.00; \$162.88	weekly	\$1306.88
9. Eli	\$37.70 \$452.40; \$103.65	monthly	\$556.05
10. Sally	\$87.97 \$1055.64; \$83.38 (refund)	monthly	\$972.26

19 d / INCOME TAXES – FILING AN INDIVIDUAL INCOME TAX RETURN

Every year there are changes made to the rules and regulations for filing an income tax return, but the method used is basically the same.

The first thing to be done is to complete the page of the income tax return which has the claims for personal exemptions (page 4).

On this page you will find all the necessary instructions. For example, let us file an income tax return for a married man, Mr. P. Caron—wife earns no income, and he has two children, Christopher, age 4 and the other, David, age 2.

- ① Mr. Caron's Basic Personal Exemption is \$1706.
- ② Since his wife does not work, he can claim the full married exemption of \$1492.
- ③ Christopher, Age 4—claim \$320
David, Age 2 —claim \$320
- ④ No other exemptions, therefore, the total exemptions are \$3838. (See form 19.1.)
- ⑤ Most people today claim the basic \$100 exemption as a standard deduction for medical expenses and charitable donations.
- ⑥ The total deductions from net income are \$3938.
- ⑦ Taxable income is, therefore, \$9912.83.

4 Determination of Taxable Income

Net Income (from line 40 on page 2) \$ 13,950.83

Interest Income deduction (Guide item 35, please attach completed Schedule 4) 0

Gifts to Canada or a province (Guide item 36, please attach receipts) 0

Non-Capital losses of other years (Guide item 37) 0

Capital losses of other years (1972 and 1973) (Guide item 38) 0

Claim for Personal Exemptions Please provide all specified details for each exemption claimed:
 • Net income of your spouse or dependants includes Old Age Security Pension and Supplement, Canada or Quebec Pension Plan benefits and Unemployment Insurance benefits— Guide item 39.
 • If you were single, divorced, separated or a widow(er) in 1974 and supported a wholly dependent relative in the same dwelling in which you resided, claim the Equivalent to Married Exemption on Schedule 6. If you are claiming dependants other than spouse and children, claim the Exemption for Other Dependents on Schedule 6.
 • If you are claiming dependants who did not reside in Canada, please complete and attach form T1E-NR which you can obtain from any District Taxation Office.

Basic Personal Exemption Claim \$1706.00 1706

Age Exemption—If you were born in 1959 or earlier
 If claiming this exemption, did you receive the Old Age Security Pension in 1974? Yes ☐ No ☒

Married Exemption If applicable, please check ☒ and claim item 1 or 2
 1. where net income in that year, while married, was not over \$314. Claim \$1492.00 1492
 2. where net income in that year, while married, was over \$314 but not over \$1,806. 1806 00

If you became married in 1974, please give date of marriage: _____

Exemption for Wholly Dependent Children (Guide item 45)
 (A) Sons, Daughters or Grandchildren (B) Certain Nieces or Nephews
 Under age 16 as of and of 1974—If child's net income was not over \$1,166, claim \$320.
 —If child's net income was over \$1,166 but not over \$1,806, claim \$320 minus one-half the amount by which the child's net income exceeds \$1,166.
 Age 16 or over as of 1974—If child's net income was not over \$1,220, claim \$686.
 —If child's net income was over \$1,220 but not over \$1,806, claim \$686 minus the amount by which the child's net income exceeds \$1,220.

Please do not claim here for a child you have claimed in the Equivalent to Married Exemption on Schedule 6:

Name of child (please attach list if space insufficient)	Relationship to you	Net income in 1974	Date of birth	Year	If over 21 in 1974, state school attended or whether infirm
Christopher	Son	20	7	1971	320
David	Son	27	6	1973	320

Other Exemptions
 Additional Personal Exemptions per Schedule 6 attached: 0
 Disability deduction for persons totally blind at any time in the year, and persons confined throughout any 12 month period ending in the year for a substantial period each day to a bed or wheelchair (Guide item 47A). Claim relates to: Self ☐ Spouse ☐
 Education deduction for eligible students and, within limitations, for persons supporting such eligible students (Guide item 47B). Self ☐ or ☐
 Standard deduction, medical expenses and charitable donations
 Claim either A or B, but not both (Guide item 48)
 A — Standard deduction of \$100.00 100
 B — The Total of Allowable Amounts below
 Medical expenses (please attach receipts and completed Schedule 3) 0
 Less: 3% of "Net Income" (line 40 on page 2) 418.53
 Allowable portion of medical expenses 0
 Add: Charitable donations (please attach receipts and completed Schedule 3) 0
 Total Allowable Amounts 0

Total of lines 42 to 45, 50 and 52 3938

Taxable Income (line 41 less line 53—please enter this amount on page 1) 9912.83

TAXABLE INCOME = GROSS INCOME — DEDUCTIONS — EXEMPTION

EXERCISES Calculate the claim for personal exemptions for each of the following situations.

1. Roderick is single. **\$1706**
2. Anthony is married. His wife does not work and receives no income. **\$3198**
3. Marie is single. **\$1706**
4. Tony is married. His wife has an income of \$1200. They have one child, 6 years old. **\$2632**
5. Brian is married. His wife earns \$200. They have two children, age 6 and 17 respectively. **\$4104**

19 e / INCOME TAXES – FILING AN INDIVIDUAL INCOME TAX RETURN

An employer, by law, has to supply each of his employees with a T4 slip. On this slip will be all the necessary personal information—name, address, employer, etc. There are numerous boxes on the T4 slip, each one showing information which will be necessary in order to file an income tax return. (Boxes A to N) As mentioned earlier, the employer was required to deduct Canada Pension Plan and Unemployment Insurance premium contributions. These are shown in Box D and E, respectively. The government sets a limit as to the amount of Unemployment Insurance and Canada Pension an employee should pay each year. However, sometimes an employer deducts too much or too little. Therefore, you are required to calculate the overpayment, if any, on a sheet provided with your income tax return. Overpayments are either refunded or used to reduce your income tax liability.



Revenue Canada
Taxation

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Impôt

T4-1974

Supplementary—Supplémentaire

EMPLOYEE: SURNAME FIRST, AND FULL ADDRESS
EMPLOYÉ: NOM DE FAMILLE D'ABORD, ET ADRESSE COMPLÈTE

→ **Caron, Paul**

212 Hammond Dr.

Missassauga, Ontario.

STATEMENT OF REMUNERATION PAID ÉTAT DE LA RÉMUNÉRATION PAYÉE

• Attach to your 1974 Income Tax Return
SEE INFORMATION ON REVERSE

• Annexer à votre déclaration d'impôt sur le revenu de 1973
VOIR LES RENSEIGNEMENTS AU VERSO

2

(A) PROVINCE OF EMPLOYMENT PROVINCE D'EMPLOI	(B) SOCIAL INSURANCE NUMBER N° D'ASSURANCE SOCIALE	(K) EMPLOYEE NO. N° DE L'EMPLOYÉ
Ontario	237 169 864	

NAME AND ADDRESS OF EMPLOYER — NOM ET ADRESSE DE L'EMPLOYEUR

Canadian Rope Products
116 Laird Ave.,
Toronto, Ontario.

(C) TOTAL EARNINGS BEFORE DEDUCTIONS 14 934 44 GAINS TOTALS AVANT DÉDUCTIONS BOX (C) AMOUNT INCLUDES ANY AMOUNTS IN BOXES (H), (J), (L) AND (M). LE MONTANT DE LA CASE (C) COMPREND TOUTS MONTANTS FIGURANT AUX CASES (H), (J), (L) ET (M).	(D) EMPLOYEE'S PENSION CONTRIBUTION CANADA PLAN 108 90 DU CANADA DU QUÉBEC COTISATION DE PENSION (EMPLOYÉ)	(E) U.I. PREMIUM 107 11 PRIME D.A.C.	(F) REGISTERED PENSION PLAN CONTRIBUTION 639 90 CONTRIBUTIONS RÉGIME ENREGISTRÉ DE PENSIONS	(G) INCOME TAX DEDUCTED 2 737 98 IMPÔT SUR LE REVENU DÉDUIT	(H) U.I. INSURABLE EARNINGS GAINS ASSURABLES A.C.	(I) U.I. PREM. RATE 1.4% TAUX DE PRIME D.A.C.	(J) C.P.P. CONTRIBUTORY EARNINGS * GAINS COTISABLES POUR R.P.C. *
	(L) TAXABLE ALLOWANCES AND BENEFITS ALLOCATIONS ET PRESTATIONS IMPOSABLES	(M) COMMISSIONS COMMISSIONS	(N) PENSION PLAN REGISTRATION NUMBER N° D'ENREGISTREMENT DU RÉGIME DE PENSIONS	Union Dues \$88.50			

* If different from Box (C)
S'ils sont différents de la Case (C)

① In determining the amount of overpayment of Canada Pension Plan, the amount deducted, as per Box D on the T4 slip, was \$108.90.

② The maximum that can be deducted is \$106.20. (See table at the back of the book.)

③ You will, therefore, claim a refund of \$2.70. (See form 19.2)

④ In calculating the unemployment insurance overpayment, the amount deducted as per Box E was \$107.11.

⑤ The maximum that can be deducted is \$99.01 (depending on the percentage premium used). (See table at the back of the book.)

⑥ A refund of \$8.10 is claimed. (See form 19.2)

Employee Overpayment of Contributions and Premiums

3

Calculation of Canada Pension Plan Overpayment (If you have contributory self-employment earnings, please see below.)

- The Employee's Canada Pension Plan Contribution Table is on pages 42 to 44 in the Guide.

Calculate Earnings Subject to Contribution as the right. If you became 18 or 70 years of age or received a retirement or disability pension under the Canada or Quebec Pension Plan in 1974, the amounts shown must be prorated as noted in Guide—item 268.

Total Contributory Earnings per T4 slips (maximum \$6,600) 6600 ^{\$} ^c -
 Less: Basic Canada Pension Plan Exemption of \$700 700
 Equals: Earnings Subject to Contribution (maximum \$5,900) 5900

Total contributions deducted per Box D on all T4 slips

Less: Required contribution—1.8% of 'Earnings Subject to Contribution' or amount per Contribution Table, maximum \$106.20

Canada Pension Plan Overpayment (Please enter this amount on line 27 on page 2 and also on line 64 on page 1.)

108 ^{\$} ^c 90
106 20
2 70

Calculation of Unemployment Insurance Overpayment (Guide item 27)

- Calculation I is to be used if your premiums were deducted at one rate throughout the year (that is, all 1.12% or all 1.4%).
- Calculation II is to be used *only* if your premiums were deducted at the two rates (1.12% and 1.4%).
- If the amount of the premium deducted by your employer is less than your required premium, please *do not* include the difference with your return.

Calculation I

- Determine the total of your Insurable Earnings from Box H on all your T4 slips. If Box H is blank, use the amount in Box C.
- Compare the total of premiums deducted per Box E on all your T4 slips to the required premium found by reference to the Employee's Unemployment Insurance Premium Table on pages 44 and 45 in the Guide, using the applicable rate of 1.12% or 1.4% and the total of your Insurable Earnings (maximum \$8,840). Please record the result below.

Total premiums deducted per Box E on all T4 slips

Deduct: Required Premium per Premium Table

Unemployment Insurance Overpayment (If (A) is greater than (B))

107 ^(A) 11
99 ^(B) 61
8 10

- If there is an overpayment, please enter the amount on line 30 on page 2 and on line 65 on page 1.
- If there is *not* an overpayment, *no further action is required*. The allowable deduction on line 31 on page 2 will be the same amount as that entered on line 29.

Calculation II

NOT APPLICABLE

Total Insurable Earnings per Box H or, if blank, per Box C on all T4 slips (maximum \$8,840)

Less: Insurable earnings subject to 1.12% premium per T4 slips (maximum \$8,840)

Equals: Insurable earnings subject to 1.4% premium

Total premiums deducted per Box E on all T4 slips

Less: Required Premium—1.12% of Insurable earnings (A), or amount per Premium Table

Required Premium—1.4% of Insurable earnings (B), or amount per Premium Table

Equals: Total Required Premium

Unemployment Insurance Overpayment (Please enter this amount on line 30 on page 2 and on line 65 on page 1.)

 ^(A)
 ^(B)

form 19.2

EXERCISES In problems 1 to 5, calculate the annual Canada Pension Plan contributions, including any overpayment, if applicable. (See tables in appendix.)

	CONTRIBUTIONS DEDUCTED PER BOX D—T4 SLIP	EARNINGS SUBJECT TO CONTRIBUTION	CONTRIBUTION AS PER TABLE	OVERPAYMENT IF ANY
1.	\$59.25	\$3025	\$54.45	\$4.80
2.	\$21.67	\$1117	\$20.07	\$1.60
3.	\$16.35	\$827	\$14.85	\$1.50
4.	\$69.67	\$3850	\$69.21	\$0.48
5.	\$117.65	\$6975	\$106.20	\$11.45

In problems 6 to 10, calculate the annual Unemployment Insurance premiums, including any overpayment, if applicable. (See table in appendix.)

	PREMIUMS (1.12%) DEDUCTED PER BOX E T4 SLIP	INSURABLE EARNINGS BOX H OR C T4 SLIP	PREMIUMS (1.4%) AS PER TABLE	OVERPAYMENT IF ANY
6.	\$38.15	\$3025	\$33.88	\$4.27
7.	\$12.60	\$1117	\$12.60	—
8.	\$10.10	\$827	\$9.24	\$0.86
9.	\$44.95	\$3850	\$42.84	\$2.11
10.	\$84.15	\$6975	\$78.12	\$6.03

19 f / INCOME TAXES — FILING AN INDIVIDUAL INCOME TAX RETURN

Having completed the claim for personal exemptions and calculated the correct amount required for the Canada Pension Plan contributions and Unemployment Insurance deductions, you are now in a position to make a summary of your income and deductions. This is done on the page especially provided for these calculations—page 2 (form 19.3).

① Referring to the T4 slip, Box C shows a total earnings of \$14 934.44.

② Since there is no other employment income, the total employment earnings are \$14 934.44.

In 1974, an attempt was made to reduce your total employment earnings by 3%. (Up to a maximum of \$150.) Thus you pay less income tax. 3% of \$14 934.44 is $\frac{3}{100} \times \$14\,934.44 = \448.03 .

③ Since a maximum deduction of \$150 is allowed, we can only claim \$150.

④ Therefore, the net employment earnings are \$14 784.44.

⑤ Assuming no other income was earned, the total income is \$14 784.44.

⑥ In calculating the deductions from total income, we must refer to the T4 slip—Box D—for Canada Pension Plan contributions, less the overpayment calculated earlier.

⑦ The allowable deduction for Canada Pension Plan is, therefore, \$106.20.

⑧ Unemployment Insurance premiums deducted are shown on the T4 slip—Box E—as \$107.11.

⑨ Referring to the calculations for overpayment of Unemployment Insurance premiums, we can see that an overpayment of \$8.10 was made.

⑩ The total allowable deduction for Unemployment Insurance is, therefore, \$99.01.

⑪ Mr. Caron also had additional deductions made for a registered pension plan which he belonged to. Deductions on the T4 slip—Box F—are \$639.90.

⑫ Union dues for the year amounted to \$88.50.

⑬ The total allowable deductions are \$933.61.

⑭ The net income is \$13 850.83.

2 Determination of Net Income

97

"C"

		S	C
Income from Employment	Total Earnings Before Deductions per Box C on all T4 slips (please attach copy 2 of T4 slips)	01	14 934 44
	Commissions per Box M on all T4 slips, included in above total	02	
	Adult training allowances, net research grants, tips and gratuities (Guide item 3; please specify)	03	
	Total employment earnings (total of lines 01 and 03)	04	14 934 44
	Deduct:		
	3% of 'Total employment earnings' (line 04 above) — maximum \$150 (Guide item 4)	05	150 00
	Other allowable expenses (Guide item 5; please specify)	06	
	Total employment expenses (total of lines 05 and 06)	07	150 00
	Net employment earnings (line 04 less line 07)	08	14 784 44
Pension Income	Old Age Security Pension (\$1344.60 for year; for less than year, please refer to Guide item 6)	09	
	Canada or Quebec Pension Plan benefits (please attach copy 2 of T4A (P) slip)	10	
	Other pensions or superannuation (please attach copy 3 of T4A slips)	11	
Income from Other Sources	Taxable Family Allowance payments (Guide item 7; please attach copy of TFA1 slip)	12	
	Unemployment Insurance benefits (please attach copy 1 of T4U slip)	13	
	Taxable amount of dividends from taxable Canadian corporations (attach completed Schedule 4)	14	
	Interest and other investment income (please attach list or completed Schedule 4)	15	
	Rental income (Schedule 7)	16	
	Taxable capital gains or allowable capital losses (please complete and attach Schedule 2)	17	
	Other income (Guide item 18; please specify)	18	
Income from Self-Employment	Please report both 'Gross' and 'Net'. (Guide item 19)		
	Business income	19	
	Professional income	20	
	Commission income	21	
	Farming income	22	
	Fishing income	23	
Total Income (total of lines 08 to 23 inclusive)		24	14 784 44
Deductions from Total Income	Canada or Quebec Pension Plan Contributions (Guide items 25 and 26)		
	Contributions through employment per Box D on all T4 slips	25	108 90
	Contribution payable on self-employed earnings (from page 3)	26	
	Total Contributions (total of lines 25 and 26)	27	108 90
	Less: Overpayment of contributions (from page 3)	28	2 20
	Allowable Deduction	29	106 70
	Unemployment Insurance Premiums (Guide item 27)		
	Premiums per Box E on all T4 slips	30	107 11
	Less: Overpayment of premiums (from page 3)	31	8 10
	Allowable Deduction (line 29 less line 30)	32	99 01
	Registered pension plan contributions (Guide item 28)	33	639 90
	Registered retirement savings plan premiums (Guide item 29; please attach receipts)	34	
	Registered home ownership savings plan contributions (Guide item 30; please attach receipts)	35	
	Annual union, professional or like dues (Guide item 31; please attach receipts)	36	88 50
	Tuition fees — claimable by student only (Guide item 32; please attach receipts)	37	
Child care expenses (please complete and attach Schedule 5)	38		
Other deductions (Guide item 34; please specify)	39		
Total of lines 28 and 31 to 38 inclusive		40	933 61
Net Income (line 24 less line 39 — please enter this amount on line 41 on page 4)		41	13 850 83

Please do not use this area

19 g / INCOME TAXES — FILING AN INDIVIDUAL INCOME TAX RETURN

After the taxable income has been determined, it is carried forward to the front page of the income tax return, where a summary of tax and credits are calculated (form 19.4)

- ① The taxable income for Mr. Caron is \$9912.83.
- ② According to the table at the back of the book, the federal tax payable is \$1984 and the provincial tax payable is \$650.80.
- ③ Total tax payable is, therefore, \$2634.80.
- ④ The total tax deducted as per the T4 slip—Box G—is \$2737.98.
- ⑤ The Province of Ontario devised a Tax Credit System whereby people who own or rent their home (including roomers and boarders) may share in a Property Tax Credit, and any person who fills out a Federal Income Tax Return may share in the sales tax credit. Calculated according to a separate schedule, this amounted to \$61.35 for Mr. Caron.
- ⑥ Canada Pension Plan overpayment, previously calculated, is \$2.70.
- ⑦ Unemployment Insurance overpayment, also previously calculated, is \$8.10.
- ⑧ Total credits amount to \$2810.13.
- ⑨ The difference of \$175.33 amounts to an overpayment of taxes therefore, he will claim a refund from the Receiver General of Canada.

EXERCISE

Richard Brown lives at 7 Green Street, Apt. 23, Yourtown. He is employed by Blake and Company, Building Contractors, as a bookkeeper. Richard was born on June 6, 1945, and he is a part-time student at Yourtown College, where he is taking an advanced bookkeeping course.

Richard's tuition fees in 1974 were \$300, and he also donated \$25 to the United Appeal and \$20 to other various registered charitable organizations. He had acceptable medical bills amounting to \$210 (these were not paid for by a Provincial Government or private medical plan).

Richard's T4 slip from Blake and Company, 22 Dell Street, Yourtown, is made out as shown.

Answers at back of book.

Calculate both Federal and Provincial Tax.



Revenue Canada
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T4-1974
Supplementary—Supplémentaire

EMPLOYEE: SURNAME FIRST, AND FULL ADDRESS
EMPLOYÉ: NOM DE FAMILLE D'ABORD, ET ADRESSE COMPLÈTE

BROWN, Richard
7 Green Street, Apt 23
Yourtown

STATEMENT OF REMUNERATION PAID
ÉTAT DE LA RÉMUNÉRATION PAYÉE

• Attach to your 1974 Income Tax Return

SEE INFORMATION ON REVERSE

• Annexer à votre déclaration d'impôt sur le revenu de 1974
VOIR LES RENSEIGNEMENTS AU VERSO

2

(A) PROVINCE OF EMPLOYMENT PROVINCE D'EMPLOI	(B) SOCIAL INSURANCE NUMBER N ^o D'ASSURANCE SOCIALE	(K) EMPLOYEE NO. N ^o DE L'EMPLOYÉ
(Province)	444 444 444	
NAME AND ADDRESS OF EMPLOYER — NOM ET ADRESSE DE L'EMPLOYEUR		

Blake and Company
22 Dell Street
Yourtown

(C) TOTAL EARNINGS BEFORE DEDUCTIONS	(D) EMPLOYEE'S PENSION CONTRIBUTION CANADA PLAN	(E) U.I. PREMIUM	(F) REGISTERED PENSION PLAN CONTRIBUTION	(G) INCOME TAX DEDUCTED	(H) U.I. INSURANCE EARNINGS	(I) U.I. PREMIUM RATE	(J) C.P.F. CONTRIBUTORY EARNINGS
6600 00	106 20	92 40	162 50	954 00	6600 00	1.4 %	
GAINS TOTALS AVANT DÉDUCTIONS	DU CANADA CONTRIBUTION DE PENSION (EMPLOYÉ)	DU QUÉBEC CONTRIBUTION DE PENSION (EMPLOYÉ)	CONTRIBUTIONS RÉGIMÉ ENREGISTRÉ DE PENSIONS	IMPÔT SUR LE REVENU DÉDUIT	GAINS ASSURABLES A.C.	Taux de PRIME A.C.	GAINS CONTRIBUTABLES RÉGIMÉ A.P.C.
BOX (C) AMOUNTS INCLUDED MONTANTS INCLUS EN BOÎTES (1), (2), (3) AND (4)	(L) TAXABLE ALLOWANCES AND BENEFITS A.L. ET B.	(M) COMMISSIONS	(N) PENSION PLAN REGISTRATION NUMBER				
LE MONTANT DE LA CAISSE (C) COMPREND TOUTS MONTANTS FIGURANT AUX CAISSES (1), (2), (3) ET (4)	ALLOCATION ET BÉNÉFICE IMPOSABLES	COMMISSIONS	N ^o D'ENREGISTREMENT DU RÉGIME DE PENSIONS				

* If different from Box (C)
* Si ils sont différents de la Case (C)

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Impôt

T1-1974

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1974 Individual Income Tax Return
(and Canada Pension Plan Return, if applicable)

Family or Last Name (Please print)

Mr. **CARON**~~Ms.~~
~~Miss~~

Usual First Name and Initials (Please print)

PAUL

Present Address (Please print)

212 Hammond Dr.,

Number, Street and Apt. No., or P.O. Box No. or R.R. No.

Mississauga, Ontario

City, Province or Territory and Postal Code

Social Insurance Number

237169864

As on your Social Insurance Number card

Date of Birth

23 12 38

Day Month Year

Province or Territory of Residence on 31st December 1974, was:

ONTARIO

If self-employed in 1974, please state province where business located

Please provide other information concerning self-employment on page 3.

On 31st December, 1974, I was: Married ☒ Widowed ☐ Divorced ☐ Separated ☐ Single ☐Usual First Name of Spouse **Denise**Address of Spouse: same as mine ☒ orSpouse's Social Insurance Number **269184762**
If your spouse has no Social Insurance Number, please check box ☐

If you became or ceased to be a resident of Canada in 1974, please give:

Date of Entry _____ or Departure _____
(Guide item 46) Day Month Day MonthType of work or occupation in 1974 **Manager**Name of present employer **CANADIAN ROPE PRODUCTS**Is this your first Income Tax return? Yes ☐ No ☒If 'No', please state year for which last return filed. **19**Name on last return: same as above ☒ orAddress on last return: same as above ☒ or**Summary of Tax and Credits**

There are two methods of tax calculation (please see Guide—page 30).

Tax Adjustments

57 \$ _____

Income or Profits Tax paid
to a foreign country

70 \$ _____

Net foreign income

71 \$ _____

Total Federal Political

Contributions

72 \$ _____

Please do not use this area

74	
75	
76	
77	
78	
79	
80	
81	

If taxpayer died in 1974, please give date of death

82 Day _____ Month _____ Year _____

Taxable Income
from line 56 on page 4\$ **9912 83**

Federal Tax Payable

Provincial Tax Payable (Except Quebec)

Canada Pension Plan Contribution Payable

on Self-Employed Earnings (from page 3)

Total Payable

57 **1984 00**
58 **650 80**
59
60 **2634 80**

Total tax deducted per information slips

Ontario Tax Credits

Canada Pension Plan Overpayment (from page 3)

Unemployment Insurance Overpayment (from page 3)

Amounts paid by instalments (Tax and C.P.P.)

Total Credits

Please enter this difference in applicable space below

A difference of less than \$1.00 is neither charged nor refunded.

Refund **175 133**Please detach the refund sticker from
the cover of the Schedules and place
it over the postal code printed on
the return envelope.Balance Due **2**

Amount Enclosed

Please attach cheque or money order
payable to Receiver General for
Canada. Do not mail cash. Payment is
due not later than 30th April, 1975.Name and address of any individual or firm, other than the taxpayer,
who has prepared this return for compensation.

Name

Address

Telephone

I hereby certify that the information given in this return and in any
documents attached is true, correct and complete in every respect
and fully discloses my income from all sources.Please sign here **Caron**

Date

28th Feb.

Telephone

487-3219

Form authorized and prescribed by the Minister of National Revenue.

It is a serious offence to make a false return.

form 19.4

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Remind students of what the sales tax rate is in your province, and whether sales tax is charged on all items.

A tax may be collected from manufacturers, wholesalers, or retailers, but ultimately, it is passed on to consumers either directly or indirectly. If the tax is *hidden* in the price of the goods, it is said to be passed on *indirectly*. If it is *added* to the price of the goods, then it is passed on *directly*.

Sales tax is a direct tax, added to the price of goods or services. All provinces, except Alberta, impose sales taxes on goods sold to the final purchaser or user. Some of these provincial levies also apply to certain services including hotel and motel accommodation, telephone services, telecommunications, and dry cleaning services. They are collected by retail vendors acting as agents of the provinces. The rates are as follows:

PROVINCE	RATE OF LEVY %
Newfoundland	.7
Prince Edward Island	.8
Nova Scotia	.7
New Brunswick	.8
Quebec	.8
Ontario	.7
Manitoba	.5
Saskatchewan	.5
Alberta	.0
British Columbia	.5

These direct levies apply to taxable commodities sold for consumption in the province. They do not apply to goods sold for delivery in other provinces or to exported commodities. All provinces imposing sales taxes provide important exemptions on sales of certain types of goods, such as foodstuffs and drugs.

Rather than compute the tax on each sale, most merchants use tables to show how much tax is to be collected. Table IV at the back of the book shows a sales tax table for a 5% sales tax. A rate of 5% is equivalent to a tax of \$0.01 for each \$0.20 of the sale. On sales under \$0.11, there is no tax collected. To use the sales tax chart, find the bracket in which the transaction falls and read the tax in the tax column opposite the bracket.

EXAMPLE

Find the sales tax from Table IV for a sale of \$0.29.

Find the bracket for \$0.29. (0.28 – 0.47)

Find the tax in the column opposite. (0.02)

- The sales tax on a \$0.29 sale is \$0.02.

EXAMPLE

Find the sales tax from the table for a sale of \$0.55. Then find the total cost of the item.

Find the bracket for \$0.55. (0.48 – 0.68)

Find the tax in the column opposite. (0.03)

Add the sales tax to the sale.

$$\$0.55 + \$0.03 = \$0.58$$

- The sales tax on a \$0.55 sale is \$0.03. The total cost is \$0.58.

Discussion Question: What taxes are collected by the federal government? by provincial governments? by county and municipal governments? What are they used for?

Consider: Income taxes, excise taxes, luxury taxes, sales taxes, gasoline taxes, property taxes, and so on. Used in schools, highways, city planning, urban renewal, and so on.

Project: In a province that has a sales tax, businesses must keep records of all taxes collected. Visit several businesses and ask how they account for the sales taxes that are collected.

EXERCISES Using the sales tax table, find the tax and the total cost for these items. For transactions over \$100, allow \$5.00 tax for each \$100. Then use the table to find the tax on the amount under \$100.

ITEM	PRICE		ITEM	PRICE	
1. Ball point pen	\$0.49	\$0.03; \$0.52	2. Eraser	\$0.20	\$0.01; \$0.21
3. Screwdriver	\$0.89	\$0.04; \$0.93	4. Lunch	\$0.95	\$0.05; \$1.00
5. Book	\$1.85	\$0.09; \$1.94	6. Sweater	\$9.75	\$0.49; \$10.24
7. Dress	\$12.89	\$0.64; \$13.53	8. Art supplies	\$15.25	\$0.76; \$16.01
9. Slide rule	\$24.50	\$1.23; \$25.73	10. Camera	\$49.95	\$2.50; \$52.45
11. Binoculars	\$55.00	\$2.75; \$57.75	12. Man's suit	\$79.95	\$4.00; \$83.95
13. Bicycle	\$95.89	\$4.79; \$100.68	14. Golf clubs	\$129.95	\$6.50; \$136.45
15. Canoe	\$220.25	\$11.01; \$231.26	16. Automobile	\$2578.38	\$128.92; \$2707.30

CHECKLIST

- Assessed value (p. 250)
- Budget (p. 250)
- Dependent deduction (p. 242)
- Direct tax (p. 254)
- Exemption (p. 242)
- Federal income tax (p. 242)
- Gross income (p. 246)
- Indirect tax (p. 254)
- Market value (p. 250)
- Personal property (p. 250)
- Progressive tax (p. 242)
- Property tax (p. 250)
- Property tax rate (p. 250)
- Real property (p. 250)
- Taxable income (p. 246)
- Tax bill (p. 252)

PROBLEMS

In problems 1 and 2, compute the income tax for the year. **Answers will vary according to province.**

- Morris Anonymous is a mechanic. He is a bachelor and lives at 18 Elm Street, Apt. 22, Yourtown. Mr. Anonymous was born on August 4, 1941. Last year he worked for two employers and received T4 slips as follows:

Revenu Canada Taxation

T4-1974
Supplémentaire - Supplémentaire

EMPLOYER: SURNAME, FIRST, AND FULL ADDRESS
IMPRIMER: NOM DE LA FAMILLE (NOM), PRÉNOM ET ADRESSE COMPLÈTE

→ **ANONYMOUS, Maurice**
18 Elm Street, Apt. 22
Yourtown

Revenu Canada Impôt

ÉTAT DE LA REMUNÉRATION PAYÉE
«Attach to your 1974 Income Tax Return
S'attacher à votre déclaration d'impôt sur le revenu de 1974
POUR LE RENDRE COMPLET AU FISCAL»

(A) PROVINCE (Province) **888 888 888**

(B) SALARY (Salaire) **8100.00**

(C) BONUS (Prime) **106.20**

(D) DIVIDENDS (Dividendes) **113.40**

(E) OTHER INCOME (Autres revenus) **1429.45**

(F) TOTAL (Total) **8100.00**

(G) TAX (Taxe) **1.4%**

Revenu Canada Taxation

T4-1974
Supplémentaire - Supplémentaire

EMPLOYER: SURNAME, FIRST, AND FULL ADDRESS
IMPRIMER: NOM DE LA FAMILLE (NOM), PRÉNOM ET ADRESSE COMPLÈTE

→ **ANONYMOUS, Maurice**
18 Elm Street, Apt. 22
Yourtown

Revenu Canada Impôt

ÉTAT DE LA REMUNÉRATION PAYÉE
«Attach to your 1974 Income Tax Return
S'attacher à votre déclaration d'impôt sur le revenu de 1974
POUR LE RENDRE COMPLET AU FISCAL»

(A) PROVINCE (Province) **888 888 888**

(B) SALARY (Salaire) **1500.00**

(C) BONUS (Prime) **24.75**

(D) DIVIDENDS (Dividendes) **29.05**

(E) OTHER INCOME (Autres revenus) **443.15**

(F) TOTAL (Total) **2075.00**

(G) TAX (Taxe) **1.4%**

Mr. Anonymous received bank interest amounting to \$38.35. He donated \$20 to the United Appeal and paid union dues of \$60.

Mr. Anonymous' father died three years ago. Morris Anonymous supports his mother, Mrs. Jane Anonymous, in his own apartment. Mrs. Anonymous is the only person contributing to his mother's support. Mrs. Anonymous was born on September 21, 1910, and has a net income of \$1000 a year. Complete Mr. Anonymous' tax return.

Revenu Canada Taxation

T4-1974
Supplémentaire - Supplémentaire

EMPLOYER: SURNAME, FIRST, AND FULL ADDRESS
IMPRIMER: NOM DE LA FAMILLE (NOM), PRÉNOM ET ADRESSE COMPLÈTE

→ **ANONYMOUS, Maurice**
18 Elm Street, Apt. 22
Yourtown

Revenu Canada Impôt

ÉTAT DE LA REMUNÉRATION PAYÉE
«Attach to your 1974 Income Tax Return
S'attacher à votre déclaration d'impôt sur le revenu de 1974
POUR LE RENDRE COMPLET AU FISCAL»

(A) PROVINCE (Province) **888 888 888**

(B) SALARY (Salaire) **38.35**

(C) BONUS (Prime) **20.00**

(D) DIVIDENDS (Dividendes) **60.00**

(E) OTHER INCOME (Autres revenus) **1000.00**

(F) TOTAL (Total) **38.35**

(G) TAX (Taxe) **1.4%**

- Miss Joan Doe left school at the end of the summer term last year. On September 1, she took a position with the ABC Manufacturing Company Limited as a clerk-typist.

Between January 1 and June 30, she occasionally worked as a part-time sales clerk at the XYZ Department Store and earned \$610.

Miss Doe was born on June 8, 1956 (age 19) and lives with her parents at 397 York Street, Ourtown, Yourprovince.

Miss Doe donated \$150 to the United Appeal and other registered Canadian Charitable Organizations. Complete Miss Doe's tax return.

Revenu Canada Taxation

T4-1974
Supplémentaire - Supplémentaire

EMPLOYER: SURNAME, FIRST, AND FULL ADDRESS
IMPRIMER: NOM DE LA FAMILLE (NOM), PRÉNOM ET ADRESSE COMPLÈTE

→ **DOE, Joan**
397 York Street
Outtown

Revenu Canada Impôt

ÉTAT DE LA REMUNÉRATION PAYÉE
«Attach to your 1974 Income Tax Return
S'attacher à votre déclaration d'impôt sur le revenu de 1974
POUR LE RENDRE COMPLET AU FISCAL»

(A) PROVINCE (Province) **777 777 777**

(B) SALARY (Salaire) **1500.00**

(C) BONUS (Prime) **20.70**

(D) DIVIDENDS (Dividendes) **21.00**

(E) OTHER INCOME (Autres revenus) **104.60**

(F) TOTAL (Total) **1500.00**

(G) TAX (Taxe) **1.4%**

So You Want To Buy a Car ?

Sooner or later, most teenagers decide they want a car. Let us trace the steps of one George Jansen prior to making a car purchase.

George is a student at South Lincoln High School. During the past two years, he has held two part-time jobs in order to save enough money to buy a car. He approached Mr. Peter Wills, a friend of the family and a reputable dealer in the community. He explained his requirements to Mr. Wills and how much money he could spend on an automobile.

George had already saved up one thousand dollars, and because he was eighteen, he felt he could arrange a loan for an additional amount if he were to choose a later model car.

After appraising several automobiles, George narrowed his choice to two particular automobiles. One was a four cylinder compact model, which was two years old and could be purchased for seventeen hundred dollars. The second was a four year old intermediate, which could be purchased for fifteen hundred dollars.

Mr. Wills suggested that George test-drive the cars. George tried out both automobiles at high speeds on the Queen Elizabeth Highway, starting and stopping, backing, and at low speeds. He also checked the play on the steering, tread life on the tires, and the ignition. Although George was aware that the car had to meet inspection standards of the province, certain other factors had to be considered. He was particularly interested in seeing how well the doors, hood, and the trunk lid fit their recesses. A poor fit might mean that the car had been in an accident and that the chassis was out of line.

George was also prepared to spend up to \$14 on an electronic analysis of his choice of an automobile. This test would inform George of the condition of his engine and other mechanical parts under the hood.

Although George had decided on the two year old compact, he did not make any commitments. He decided to visit several other dealerships in the area to compare cars, prices, and service. He found that prices were very competitive for similar automobiles. There was one important difference. The guarantee and service offered by Mr. Willis' dealership was far superior to other car dealerships. The condition of the two year old compact was also superior to what was offered elsewhere.

Having made his decision, George paid a visit to his father's bank manager, Mr. Darroch.

Mr. Darroch assured George that he could qualify for an additional one thousand dollar loan providing his father was willing to co-sign the note at a rate of 12.5% per annum. George could repay this loan over a two year period at \$47.31 per month.

George protested that he required only a seven hundred dollar loan, but after answering a few questions, he was made aware why he should borrow one thousand dollars.

"You have not calculated all your expenses. Let's look at the whole picture. You have saved up one thousand dollars. You require \$1700 to pay for the automobile. The 7% provincial sales tax will add an additional \$119. The price of a license is \$27.50. Your insurance premium will also increase now that you are no longer considered a part-time driver. This will mean an additional cost of approximately two hundred dollars. As you can see, the cost of purchasing your parti-

cular automobile has exceeded two thousand dollars.”

Mr. Darroch also reminded George that he would be required to budget an additional \$12 a week for gas and routine maintenance. George would also have to begin saving and setting aside an additional sum for unexpected repairs, which would no doubt be forthcoming.

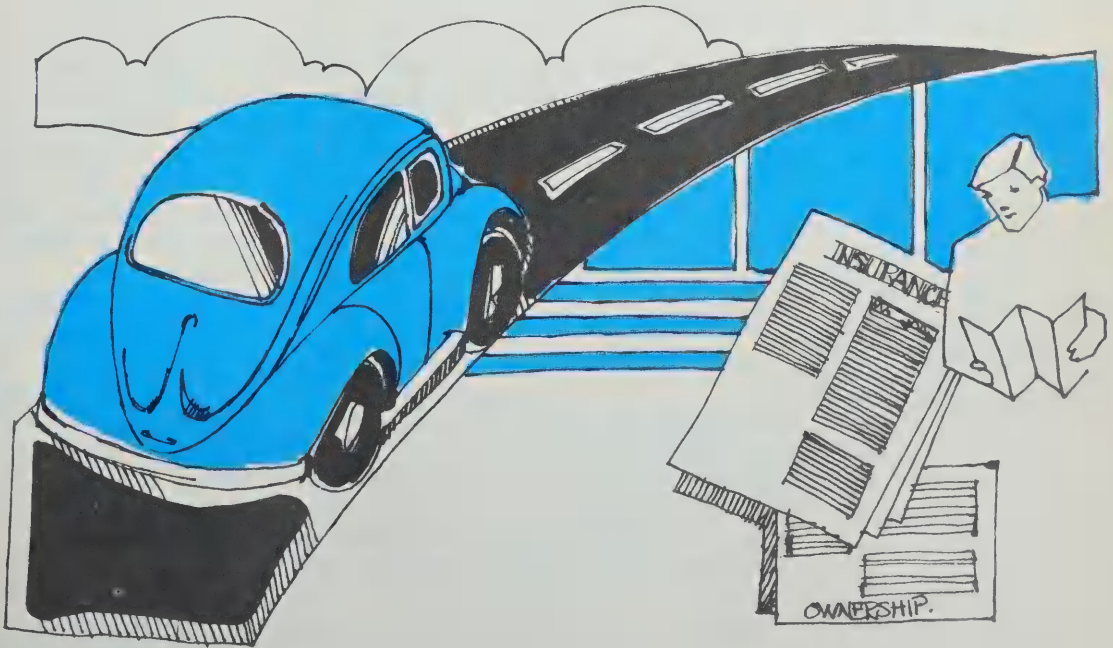
Mr. Darroch also suggested that depreciation would reduce the value of George’s automobile each year. “The largest decrease in the value of the automobile occurs in the first year. The older the car, the lower is the rate of depreciation. To determine the average rate of depreciation per year, you would subtract the sale price from the original price and divide by the number of years you kept the car. If you purchased the compact for \$1700, kept it four years, and sold it for \$500, you would subtract the sales price from the original price, \$1700. In four years, the depreciation would be \$1200, or \$300 per year.”

“Thanks for the advice, Mr. Darroch. I plan to go home and consider all the financial implications of the car purchase,” replied George.

After discussing the matter with his parents, George decided to purchase the particular compact. He was certain that working twenty hours a week at \$2.60 an hour would suffice to pay the necessary costs. He would also work all summer and save enough money to help cover any additional expenses incurred during the year.

Mr. Prussers, the service manager at Wills, assured George that he had made the right decision in purchasing the compact. “The cost of repairs should they arise will be lower, and the cost of gas and maintenance will be much lower.”

George became aware very quickly, that buying a car was a much more complex chore than he had originally anticipated.



- The rate of interest indicates the price paid for financing. Any money saved by economical financing can be used for savings or to purchase other goods and services.
- Ask students to look at these questions from several points of view. For example, in the first question, consider how you would react if you were the pedestrian. Then discuss the legal responsi-

CHAPTER 20

bility: if you hit a pedestrian in a crosswalk, you are legally liable for the medical and hospital expenses, as well as indemnity for pain, loss of income from employment, and punitive damages for your carelessness. If someone else has an accident while driving your car, you are responsible for all bodily injury and property damage claims of the innocent party. The class may also want to discuss the mechanics of reporting an accident, calling the police and ambulances, and making reports to the police and the insurance companies.

- If you are an undesirable risk because of a poor driving record caused by accidents and arrests, or because you are engaged in illegal activities, such as use of narcotics or driving while intoxicated. Students may have some additional ideas about this question based on their experiences.

AUTOMOBILE OWNERSHIP

RESEARCH/DISCUSS

- If a buyer can afford the monthly payments for an automobile, why should he be concerned about the rate of interest that he will pay?
- What happens if you are driving an automobile and strike a pedestrian in a crosswalk?
- Suppose you loan your car to a friend who drives through a red light and collides with another car. What is your responsibility if the other car is damaged and the driver injured?
- Under what conditions might an insurance company cancel your automobile insurance?

IN THIS CHAPTER YOU WILL LEARN . . .

- how automobile finance charges are computed
- how flat charges differ from simple interest charges
- how the premiums for automobile insurance are determined
- how to find short rate and pro-rata cancellation return premiums

CIAG AUTOMOBILE INSURANCE QUOTATION			
Name John Patrick Wilson		Age and Value 1 January 20, '76 6 yrs. (\$700)	
Category and exposure 40 (A-G) Urban			
PUBLIC LIABILITY Protects you and others driving your car with your license against legal liabilities in bodily injury, death or property damage.			
Recommended coverage	\$300,000 inclusive (for injury, death and property damage in any one accident)	Premium \$ 146	2
Alternative coverages	\$100,000 inclusive	\$	
	\$50,000 inclusive	\$	
Passengers carried for compensation		\$146	\$1460
INSURER'S ACCIDENT BENEFITS In the event of an accident in which you or any person in your car is injured or killed while riding in other automobiles (Benefit paid by the insurer's accident benefit fund, not by the insurer's liability fund). Death benefits of \$5,000 for injured or killed or spouse, increased by \$1,000 for each dependent person first, up to \$1,000 for each dependent child according to age. Disability income of 80 percent of wages (to \$70 a week to a maximum of 184 weeks for temporary disability, or for duration of total disability). Medical and rehabilitation payments up to \$5,000 a person, and funeral costs up to \$500 a person.			
FAMILY ACCIDENT INSURANCE Supplemental benefits payable on addition to your policy of a person not eligible for the accident benefit fund (e.g., a non-immediate family member).			3
ACCIDENTAL DEATH AND IMPAIRMENT Up to \$12,000 (depending on age, marital status and use of car) for you or a member of your immediate family, 13 or older who is accidentally killed or disabled in your automobile.		\$ 12	\$1
ACCIDENT WEEKLY INCOME Up to \$25 a week for up to 52 weeks (after two weeks deductible) if you are totally disabled by an automobile accident.		\$3	
PHYSICAL DAMAGE Covers damage to your automobile caused by collision with another vehicle or object, stationary or moving, or by fire.			4
Deductible premium:	\$25 \$46 \$50 \$100 \$	\$46	\$3
COMPREHENSIVE Covers accidental damage from falling objects, fire, theft, wind, hail, flood, vandalism and other causes. Coverage is \$500,000 per year, 7 hours, up to \$5 a day, to a total limit of \$25,000 for the year. Deductible is \$50 except for damage caused by fire.		\$10	\$1
LOSS OF USE Covers loss of use of your automobile caused by collision with another vehicle or object, stationary or moving, or by fire.		\$4	
*CIAG does not increase premiums without regard for the amount of a claim, but charges a claim fee based on the amount of the loss payment. †Policy fees paid once only, to cover underwriting and issuing expenses.		FIRST PREMIUM PLUS POLICY FEES 218 RENEWAL PREMIUM (if rating unchanged) 19.60	5

A driver of an automobile must be able to afford not only the cost of a car and maintenance, but insurance costs as well. The above price quotation indicates that John Patrick Wilson is planning to take out an insurance policy for a period of one year. The insurance agent can advise each driver on what coverage is best for him. It is also advisable to shop around for automobile insurance in order to get the best possible protection at the best possible price. Certain insurance companies also have reputations for poor service in times of need. It is advisable to learn as much as possible about your insurance company.

① Notice the name of the individual, the category and exposure, territory, age and value. The *category* describes the age of the driver, sex, and marital status. *Exposure* is determined on the basis of the amount of driving an individual does in a year. *Territory* describes whether urban or rural. *Age and value* describes the automobile.

② Recommended coverage is \$300 000 for Public Liability.

③ Supplementary benefits.

④ Physical Damage: The newer the car — the higher the rate. Deductible: The lower the deduction — the higher the rate.

⑤ Total premium is entered here. The purchaser may pay one-half of the yearly amount.

20 a / FINANCE CHARGES

Have students bring automobile sales contract forms to class. Have them check for the word "interest." Usually interest is not mentioned, and instead is included in the time selling price of the car.

Discussion Question: If you were buying a car, would you buy a new one or a used one? Why?

Consider: Advantages of a new car—pride of ownership, new car warranty, lower operating and maintenance costs, greater reliability, new innovations. Advantages of a used car—lower initial cost and financing charges, less depreciation.

In Chapter 16, we found that

$$\text{Finance charge} = \text{Cash unpaid balance} \times \text{Flat rate}$$

where the cash unpaid balance was the cash selling price minus the sum of the down payment and trade-in; and the flat rate was the product of the rate per month and the number of months. We use these same formulas for finding the finance charge and monthly payment on an automobile.

EXAMPLE

The cash unpaid balance, including sales tax, for a Chevrolet is \$1550. Find the finance charge for a 24-month contract if the rate per month is 1%.

Find the flat rate.

$$24 \times 1\% = 24\%$$

Find the finance charge.

$$0.24 \times \$1550 = \$372$$

- The finance charge is \$372.

After you purchase a car, you must register it with your provincial government. The province will then send you a registration certificate.

① The car is described by license number, engine number, make, model, and so on.

② The owner's name and address are shown.

PASSENGER MOTOR VEHICLE PERMIT									
1973				ONTARIO		PLATE N° JTS341			
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS									
HON. JOHN R. RHODES, Minister					A. T. C. McNAB, Deputy Minister				
ISSUED PURSUANT TO THE HIGHWAY TRAFFIC ACT FOR THE VEHICLE DESCRIBED BELOW									
MAKE	YEAR	MODEL	NO. CYLS.	MOTIVE	FEE PAID				
Volkswagen	75	173861	4	POWER	21				
COLOR	V.I.N. OR	SERIAL NO.							
vel		1753227863							
BODY STYLE	ENGINE	NO.							
sdn		FC043019							
To Schuetze, Mary G					1				
DRIVER	2								
LIC. NO.	S1543 52722 75813								
ADDRESS	134 Tulane Ave.								
POST OFFICE	Don Mills Ont. M3A 2C3								
PREV. PLATE NO.	YR.	OFF.	MO.	YR.					
orig.	19	18	4	75					
ISSUE DATE					R. Simpson				
REGISTRAR OF MOTOR VEHICLES									

EXAMPLE

The cash unpaid balance and sales tax for a Chrysler is \$2325. If the rate per month is $\frac{3}{4}\%$, find the finance charge for a 20-month contract.

Find the flat rate.

$20 \times \frac{3}{4}\% = 15\%$

Find the finance charge.

$0.15 \times \$2325 = \348.75

- The finance charge is \$348.75.

WILLS MOTORS (SMITHVILLE) LTD.
SMITHVILLE, ONTARIO L0M 2A0
TELEPHONE 687-3350

George Jensen
R.R.#2
Caledonia, Ont.

72 Ford LTD JBE342

8 Spark Plugs 13.20
1 Condenser 1.90
1 Set points 3.10
AC 212 Element 6.35
FO 57 Filter 2.10
PCV valve 2.65
3/2 Filter 1.10
D49 Rotor 1.90
oil Filter 3.30
37.05

Ignition Tune-up 12.75
grease-oil-filter 1.30
Rotate tires 2.00
general inspection N.C.

PAID IN FULL
with
Thank

The purchaser of an automobile must also be able to afford the cost of maintenance. The work order above illustrates the cost of a periodic check and maintenance of an automobile.

EXERCISES Find the finance charge for these installment sales contracts. The cash unpaid balance includes the sales tax, if any.

NUMBER OF			NUMBER OF		
CASH UNPAID	MONTHLY	MONTHLY	CASH UNPAID	MONTHLY	MONTHLY
BALANCE	PAYMENTS	FLAT RATE	BALANCE	PAYMENTS	FLAT RATE
1. \$976.00	6	$\frac{1}{2}\%$ \$29.28	2. \$608.00	8	$\frac{1}{2}\%$ \$24.32
3. \$800.00	9	$\frac{1}{2}\%$ \$36.00	4. \$358.00	10	$\frac{1}{2}\%$ \$17.90
5. \$542.00	12	$\frac{3}{4}\%$ \$48.78	6. \$771.00	12	$\frac{3}{4}\%$ \$69.39
7. \$805.00	14	$\frac{3}{4}\%$ \$84.53	8. \$1289.00	20	$\frac{3}{4}\%$ \$193.35
9. \$1313.57	12	1% \$157.63	10. \$1425.35	15	1% \$213.81
11. \$1502.10	16	1% \$240.34	12. \$1716.43	18	1% \$308.96
13. \$2239.41	24	1% \$537.46	14. \$2335.50	27	1% \$630.59
15. \$3044.25	30	1% \$913.28	16. \$3326.11	36	$1\frac{1}{4}\%$ \$1496.75
17. \$3416.22	32	$1\frac{1}{4}\%$ \$1366.49	18. \$3527.35	33	$1\frac{1}{4}\%$ \$1455.03

Point out that the amount of the monthly payment is important to the buyer because it has to fit his budget of monthly expenses.

After you know the cash unpaid balance and the finance charge, you can compute the monthly payment.

$$\text{Monthly payment} = \frac{\text{Cash unpaid balance} + \text{Finance charge}}{\text{Number of months}}$$



The sum of the cash unpaid balance and the finance charge is called the *contract unpaid balance*.

Discussion Question: What is a "warranty?" Do you get the same warranty on a used car as on a new one?

Consider: Definition of warranty—written promise, binding to the seller; express warranties; implied warranties. Varying terms of warranty—amount of protection; period of time; and so on.

This chart for 1% per month flat charge is very nearly the same as a chart for 24% simple interest.

EXAMPLE

The cash unpaid balance on a car, including sales tax, is \$842. If the contract is for 10 months and the rate per month is 1%, what is the amount of each monthly payment?

Find the flat rate.

$$10 \times 1\% = 10\%$$

Find the finance charge.

$$0.10 \times \$842 = \$84.20$$

Find the contract unpaid balance.

$$\$842.00 + \$84.20 = \$926.20$$

Divide the contract unpaid balance by the number of months.

$$\$926.20 \div 10 = \$92.62$$

- The monthly payment is \$92.62.

Many car dealers use tables like table 20.1 to find the monthly payments.

EXAMPLE

The cash unpaid balance on a car, including sales tax, is \$1776. If the contract is for 12 months and the rate per month is 1%, find the amount of each monthly payment.

Find the monthly payment on \$1000 for 12 months. (\$93.33)

Find the monthly payment on \$700 for 12 months. (\$65.33)

Find the monthly payment on \$70 for 12 months. (\$6.53)

Find the monthly payment of \$6 for 12 months. (\$0.56)

Find the sum of the monthly payments.

$$\$93.33 + \$65.33 + \$6.53 + \$0.56 = \$165.75$$

- Each monthly payment is \$165.75.

FINANCE PAYMENT CHART
1% Per Month
(Computed on Original Unpaid Balance)

MONTHLY PAYMENTS

Unpaid Balance	9 Mos.	12 Mos.	18 Mos.	24 Mos.	30 Mos.	36 Mos.
\$ 1.00	\$ 0.12	\$ 0.09	\$ 0.06	\$ 0.05	\$ 0.04	\$ 0.30
2.00	0.24	0.18	0.13	0.10	0.08	0.07
3.00	0.36	0.28	0.19	0.15	0.13	0.11
4.00	0.48	0.37	0.26	0.20	0.17	0.15
5.00	0.60	0.46	0.32	0.25	0.21	0.18
6.00	0.72	0.56	0.39	0.31	0.26	0.22
7.00	0.84	0.65	0.45	0.36	0.30	0.26
8.00	0.96	0.74	0.52	0.41	0.34	0.30
9.00	1.09	0.84	0.59	0.46	0.39	0.34
10.00	1.21	0.93	0.65	0.51	0.43	0.37
20.00	2.42	1.86	1.31	1.03	0.86	0.75
30.00	3.63	2.80	1.96	1.55	1.30	1.13
40.00	4.84	3.73	2.62	2.06	1.73	1.51
50.00	6.05	4.66	3.27	2.58	2.16	1.88
60.00	7.26	5.60	3.93	3.10	2.60	2.26
70.00	8.47	6.53	4.58	3.61	3.03	2.64
80.00	9.68	7.46	5.24	4.13	3.46	3.02
90.00	10.90	8.40	5.90	4.65	3.90	3.40
100.00	12.11	9.33	6.55	5.16	4.33	3.77
200.00	24.22	18.66	13.11	10.33	8.66	7.55
300.00	36.33	28.00	19.66	15.50	13.00	11.33
400.00	48.44	37.33	26.22	20.66	17.33	15.11
500.00	60.55	46.66	32.77	25.83	21.66	18.88
600.00	72.66	56.00	39.33	31.00	26.00	22.66
700.00	84.77	65.33	45.88	36.16	30.33	26.44
800.00	96.88	74.66	52.44	41.33	34.66	30.22
900.00	109.00	84.00	59.00	46.50	39.00	34.00
1000.00	121.11	93.33	65.55	51.66	43.33	37.77
2000.00	242.22	186.66	131.11	103.33	86.66	75.55
3000.00	363.33	280.00	196.66	155.00	130.00	113.33
4000.00	484.44	373.33	262.22	206.66	173.33	151.10
5000.00	605.55	466.66	327.77	258.33	216.66	188.88

Monthly payment
on \$70 for 12
months at 1%.

Monthly payment
on \$1000 for 12
months at 1%.

table 20.1

EXERCISES Find the amount of each monthly payment for these automobile sales contracts. The cash unpaid balance includes the sales tax. Use table 20.1 when possible.

	CASH UNPAID BALANCE	NUMBER OF MONTHLY PAYMENTS	MONTHLY FLAT RATE		CASH UNPAID BALANCE	NUMBER OF MONTHLY PAYMENTS	MONTHLY FLAT RATE
1.	\$796.00 \$117.69	7	1/2 %	2.	\$860.00 \$147.63	6	1/2 %
3.	\$557.00 \$58.49	10	1/2 %	4.	\$853.00 \$75.35	12	1/2 %
5.	\$425.00 \$38.60	12	3/4 %	6.	\$717.00 \$65.13	12	3/4 %
7.	\$608.00 \$47.99	14	3/4 %	8.	\$929.00 \$65.03	16	3/4 %
9.	\$1134.42 \$74.37	18	1 %	10.	\$1213.45 \$113.26	12	1 %
11.	\$1452.21 \$118.25	14	1 %	12.	\$1583.58 \$114.81	16	1 %
13.	\$1122.17 \$57.98	24	1 %	14.	\$1435.37 \$69.56	26	1 %
15.	\$1833.30 \$84.03	30	1 1/4 %	16.	\$1217.92 \$52.10	36	1 1/2 %

20 C / SIMPLE INTEREST RATE

The simple interest rate to finance an automobile with equal monthly payments is approximately twice the annual flat rate. To compute the simple interest rate, divide the finance charge by the average unpaid balance.

$$\text{Simple interest rate} = \frac{\text{Finance charge}}{\text{Average unpaid balance}}$$

This method is an approximation. The true average balance is the sum of the original balance and the balance at the beginning of the last month, divided by two. To find the exact interest, use the installment interest formula on page 198.

The *average unpaid balance* is the average of the starting cash unpaid balance and the ending cash unpaid balance. Since the ending balance is zero, the sum of the balances is the starting balance. Dividing the sum by 2, gives the average unpaid balance during the life of the contract. For example, if the cash unpaid balance is \$1000, the average unpaid balance is \$500.

$$\frac{\$1000 + \$0}{2} = \$500$$

EXAMPLE

The cash unpaid balance, including sales tax, for the purchase of an automobile is \$800. The flat rate per month is 1% and the contract is for 12 monthly payments. Find the approximate rate of simple interest equivalent to the flat rate.

Find the finance charge.

$$12 \times 1\% = 12\% = 0.12$$

$$0.12 \times \$800 = \$96$$

Find the average unpaid balance.

$$\$800 \div 2 = \$400$$

Divide the finance charge by the average unpaid balance.

$$\$96 \div \$400 = 0.24 = 24\%$$

- The rate of simple interest per year is approximately 24%.

Work this example using the installment interest formula to compare the simple interest rates.

$$I = \text{finance charge} = \$96$$

$$P = \text{monthly payment of cash unpaid balance} = \$66.67$$

$$T = 78/12 = 13/2$$

$$\begin{aligned} R &= \frac{I}{P \times T} = \frac{\$96}{\$66.67 \times 13/2} \\ &= 0.221 \\ &= 22.1\% \end{aligned}$$

EXAMPLE

The cash unpaid balance, including sales tax, for the installment purchase of an automobile is \$725. Find the approximate rate of simple interest per year if the flat rate is 1% per month and the contract is for 18 months.

Find the finance charge.

$$18 \times 1\% = 18\% = 0.18$$

$$0.18 \times \$725 = \$130.50$$

Find the average unpaid balance.

$$\$725 \div 2 = \$362.50$$

Project: Visit a bank and find out what is necessary for you to secure a car loan. Ask them to show you how they figure the finance charges.

Find the rate of simple interest for 18 months.

$$\$130.50 \div \$362.50 = 0.36 = 36\%$$

Find the rate of simple interest for 12 months (the annual rate).

$$^{12}_{18} \times 36\% = ^{2}_{3} \times 36\% = 24\%$$

- The rate of simple interest per year is approximately 24%.

FACTS AND FIGURES

Over 7 700 000 Canadians hold drivers' licences. The ten provinces collect about \$300 million a year in vehicle registration and drivers' fees and \$950 million in gasoline taxes. Gasoline tax rates vary from 25 cents per gallon in Newfoundland to 11 cents in the Northwest Territories and the Yukon; the national average is 17.1 cents. A federal sales tax of 12 percent collected from the manufacturers on all new automobiles amounts to about \$100 million a year. The average cost per vehicle of taxes and licences is \$141 per year.

Canada's first motor vehicle is believed to have been an electric car built in 1893 by the Dixon Carriage Works in Toronto. The first gasoline car was built by George Foote Foss in his bicycle-repair shop in Sherbrooke, Quebec in 1897. Factory production of automobiles started in Windsor, Ontario in 1904 and in Oshawa, Ontario in 1907.

Motor vehicle registrations in Canada for 1972 were 9 619 400. More than $\frac{2}{3}$ of the above registrations were in Ontario, Quebec, and British Columbia.

Canada today has over 450 000 miles of highways to carry the almost 10 million motor vehicles.

Facts and Figures

(1) What percent of the current Canadian population hold drivers' licences?

(2) Why do provinces collect revenue in the form of gasoline taxes and vehicle registrations?

(3) How do you account for the fact that there are 7 700 000 Canadians holding drivers' licences and there are almost 10 million motor vehicles in Canada today?

(4) List the names of car manufacturers who have plants in Canada?

EXERCISES Find the approximate simple interest rate per year to finance an automobile on the installment plan with equal monthly payments.

	CASH UNPAID	FINANCE	NUMBER OF		CASH UNPAID	FINANCE	NUMBER OF
	BALANCE	CHARGE	MONTHLY		BALANCE	CHARGE	MONTHLY
			PAYMENTS				PAYMENTS
1.	\$489.50	\$36.12	6 29.5%	2.	\$725.32	\$48.96	6 27.0%
3.	\$831.45	\$78.99	8 28.5%	4.	\$903.10	\$92.31	8 30.7%
5.	\$1050.25	\$115.52	9 29 $\frac{1}{3}$ %	6.	\$1176.14	\$129.38	10 26.4%
7.	\$1285.33	\$147.81	10 27.6%	8.	\$1352.68	\$162.32	12 24.0%
9.	\$1440.03	\$201.60	12 28.0%	10.	\$1475.36	\$250.81	15 27.2%
11.	\$1510.85	\$271.95	18 24.0%	12.	\$1631.47	\$326.29	18 26 $\frac{2}{3}$ %
13.	\$1819.26	\$436.62	21 27.4%	14.	\$1972.00	\$493.74	22 27.3%
15.	\$2057.38	\$493.77	24 24.0%	16.	\$2529.15	\$834.60	30 26.4%

Project: Find out what the financial responsibility law pertaining to automobiles is in your province and what type of insurance must be carried. Find out if there are any penalties for disobeying or evading financial responsibility.

Discuss these underwriting factors in more detail, pointing out the conditions that might raise the premiums.

Once you become a car owner, you will want to get insurance in case of an accident or other loss. Automobile insurance is divided into two basic categories:

- (1) Comprehensive-Collision (damage to your car), and
- (2) Liability (damage to another car or injury to a person).

First, let's consider damage to your car. *Collision* insurance covers losses from collisions with other moving objects or collisions with stationary objects. *Comprehensive* insurance covers losses arising from fire, theft, vandalism, hail and windstorms, and falling objects. Most comprehensive claims are for theft—either the whole car or its parts (tires, hub caps, radios, tape decks, and so on).

The amount you pay for your insurance is based on several *underwriting factors*. For instance, if you are an unmarried male driver, under 21, your premiums are higher because insurance companies pay more claims involving unmarried, male drivers, under 21. Underwriting factors vary from one company to another, but the following will generally affect your premium.

- (1) Where you keep the car.
- (2) Who you are—your age, sex, and marital status.
- (3) Who drives your car.
- (4) How the car is used—for pleasure, for driving to and from work, or for business.
- (5) The value of your car.
- (6) Your driving record—the number of traffic summonses for moving violations in the past two years.

The basic collision and comprehensive premiums are determined by the value of the car. All cars are assigned code letters and numbers to indicate the car's value.



Newer, more expensive car—higher premium.

Table 20.2 shows the physical damage premiums for a metropolitan area currently used by a leading insurance company. The table is divided into three parts, one for comprehensive, one for \$50 deductible collision, and one for \$100 deductible collision.

These numbers show the age of the car: this year's cars are 1, last year's are 2, two years ago are 3, and all others are 4.

\$50 deductible collision means you pay \$50 of the damages and the insurance company pays everything over that.

Private Passenger Automobile
Metropolitan Territory
Basic Rates
Physical Damages

COMPREHENSIVE				\$50 DEDUCTIBLE COLLISION				\$100 DEDUCTIBLE COLLISION			
Actual Cash Value Code	Vehicle Age Code			Actual Cash Value Code	Vehicle Age Code			Actual Cash Value Code	Vehicle Age Code		
	1	2-3	4		1	2-3	4		1	2-3	4
A-G	\$18	\$15	\$10	A-G	\$61	\$53	\$46	A-G	\$35	\$31	\$26
H-I	\$21	\$18	\$13	H-I	\$72	\$63	\$54	H-I	\$50	\$44	\$38
J-K	\$26	\$22	\$15	J-K	\$84	\$74	\$63	J-K	\$62	\$54	\$46
L-M	\$31	\$26	\$19	L-M	\$97	\$85	\$73	L-M	\$73	\$64	\$55
N-O	\$40	\$34	\$24	N-O	\$112	\$98	\$84	N-O	\$85	\$74	\$64
P-S	\$51	\$43	\$30	P-S	\$124	\$109	\$93	P-S	\$95	\$83	\$71
T-Z	\$64	\$54	\$38	T-Z	\$135	\$118	\$102	T-Z	\$104	\$91	\$78

table 20.2

Lower priced cars have letters at the beginning of the alphabet.

Higher priced cars have letters at the end of the alphabet.

\$100 deductible collision means you pay \$100 of the damages and the insurance company pays everything over that.

We can find the basic comprehensive premium if we have the code letter and number. We just find the line showing the letter code and the column showing the number code. The point of intersection shows the basic comprehensive premium for the car. We find the premiums for collision insurance the same way. For example, for a K-3 car, the basic comprehensive premium is \$22; the basic \$50 deductible collision premium is \$74; the basic \$100 deductible collision premium is \$54.

EXERCISES Find the basic comprehensive, \$50 deductible collision, and \$100 deductible collision premiums for these cars.

1. A car one year old, coded L. \$31; \$97; \$73
2. A car four years old, coded J. \$15; \$63; \$46
3. A car two years old, coded Z. \$54; \$118; \$91
4. A new car, coded T. \$64; \$135; \$104
5. A car four years old, coded A. \$10; \$46; \$26
6. A car ten years old, coded O. \$24; \$84; \$64
7. A new car, coded G. \$18; \$61; \$35
8. A car one year old, coded N. \$40; \$112; \$85
9. A car three years old, coded P. \$43; \$109; \$83
10. A car six years old, coded K. \$15; \$63; \$46

20 e / CAR INSURANCE / RATINGS

The basic comprehensive and collision premiums, such as those in table 20.2, are used with rating factors to find the premiums for a particular person and car. Table 20.3 shows the rating factors for private passenger cars. The premium for a particular person and car is the product of the rating factor and the basic premium.

$$\text{Premium} = \text{Rating factor} \times \text{Basic premium}$$

For example, suppose the rating factor from table 20.3 is 1.80 and the basic premium from table 20.2 is \$76. Then the premium would be

$$1.80 \times \$76 = \$136.80$$

Mention that most automobile insurance companies are now allowing a "reduced rate." The student driver must have successfully completed a driver education program.

When more than one person drives a car, the premium charged is for the driver with the highest rating factor. For instance, if the owner of the car has a rating factor of 1.20, his son has a factor of 1.95, and his daughter has a factor of 1.35; the rating factor used by the insurance company would be 1.95, the factor of the son.

table 20.3

**Private Passenger Automobile
Primary Rating Factors**

Class Code	Driver	Pleasure Use	Driven to Work	Business Use
10 11	Single Female Age 16–20 No driver's training With driver's training	1.45 1.35	1.55 1.45	1.95 1.85
20 21	Married Male Age 16–20 No driver's training With driver's training	1.80 1.70	1.90 1.80	2.30 2.20
30	Married Male Age 21–24	1.20	1.30	1.70
40 41 42	Single Male Occasional Driver Age 16–20 No driver's training Age 16–20 With driver's training Age 21–24	2.10 1.95 1.45	2.20 2.05 1.55	2.60 2.45 1.95
50 51 52 53	Single Male Principal Driver Age 16–20 No driver's training Age 16–20 With driver's training Age 21–24 Age 25–29	3.30 2.85 2.50 1.40	3.40 2.95 2.60 1.50	3.80 3.35 3.00 1.90
60 70 80	Female Sole Driver Age 30–64 Driver Age 65 or Over General (All Other)	1.20	1.30	1.70

EXAMPLE

Find the premium for comprehensive and \$100 deductible collision for a K-3 car in a metropolitan territory. The drivers are a married man, age 45, who drives to and from work and his daughter, single, age 18, who has completed driver's training.

Use table 20.3 to find the rating factors.

Father: 1.30

Daughter: 1.35

Use table 20.2 to find the basic comprehensive and \$100 deductible collision premiums for a K-3 car.

Comprehensive premium: \$22

\$100 deductible collision premium: \$54

Total basic premium: $\$22 + \$54 = \$76$

Multiply the total basic premium by the highest rating factor.

$1.35 \times \$76 = \102.60

- The premium for the insurance is \$102.60.

Project: Ask several relatives or friends what kind of automobile insurance they carry and how much the premiums are. Do the premiums vary greatly?

EXERCISES Find the premiums for these automobile insurance policies. All cars are kept in the metropolitan territory.

AUTOMOBILE	CODE	COVERAGE	DRIVERS
1. Chevrolet Camaro	I-4	Comprehensive	Single man, age 20, with driver's training. Pleasure use. \$37.05
2. Buick Skylark	N-2	Comprehensive \$100 deductible	Married man, age 42, drives to work. Wife, age 35. \$140.40
3. Plymouth Belvedere	J-1	Comprehensive	Single man, age 25. Pleasure use. \$36.40
4. Oldsmobile Toronado	T-2	Comprehensive \$100 deductible	Married man, age 48, drives to work. Wife, age 46. Daughter, single, age 18, with driver's training.
5. Ford Maverick	B-3	Comprehensive \$50 deductible	Single female, age 26, drives to work. \$195.75 \$88.40
6. Lincoln Continental	T-1	Comprehensive \$100 deductible	Married man, age 29. Wife, age 28. Pleasure use. \$201.60
7. Chrysler New Yorker	R-4	Comprehensive \$100 deductible	Married man, age 24, drives to work. Wife, age 24. \$131.30
8. Ford Mustang	J-1	Comprehensive	Single female, age 25, drives to work. \$33.80
9. Mercury Monterey	L-1	Comprehensive \$50 deductible	Single man, age 23, drives to work. \$332.80
10. Dodge Dart	K-2	Comprehensive \$100 deductible	Married man, age 25, drives to work. Wife, age 20. \$98.80
11. Cadillac DeVille	Q-4	Comprehensive \$100 deductible	Single man, age 28. Business use. \$191.90

Now let's consider the second category of automobile insurance—liability. *Liability* insurance protects you from claims or law suits if you are responsible for an accident. Claims may be for bodily injury (including death) or for property damage or for both.



The property damage covered by liability is for the property owned by someone else.

For example, suppose you are responsible for an accident in which the driver of another car is injured and his car is damaged. Your liability insurance would cover financial responsibility to the injured driver and repairs to his car. It would also take care of expenses for law suits. Your collision insurance would cover repairs to your car.

The premiums for liability insurance are based on the same underwriting factors as the premiums for physical damage insurance, with one exception. The code letters and numbers to indicate the value of your car are not used because *your* car's value is not important to liability claims.

Premiums for liability insurance vary depending on the coverage you want. Bodily injury coverage starts at \$15 000 and goes as high as you want, perhaps \$500 000. Property damage coverage starts at \$5000 and also goes as high as you wish. A kind of shorthand is used by insurance companies. For example, 15/30,5M means

- (1) bodily injury claims are covered to \$15 000 for any *one person* who is injured or killed in an accident,
- (2) claims for all persons injured or killed in *one accident* are covered to \$30 000, and
- (3) property damage claims are covered to \$5000 for any *one accident*.

Your liability insurance may not cover *all* expenses if you are involved in an accident. It depends on your coverage. Suppose you had the coverage above (15/30,5M) and were responsible for an accident in which another driver was injured. And suppose he filed a law suit against you and was awarded \$17 000 damages. Your liability insurance would pay \$15 000—you would have to pay the additional \$2000.

Table 20.4 shows the basic liability premiums for certain bodily injury and property damage coverage for a metropolitan territory. To find the liability premium, multiply the rating factors shown in table 20.3 and the basic premiums from table 20.4.

$$\text{Premium} = \text{Rating factor} \times \text{Basic premium}$$

Discussion Question: What is "no fault" automobile insurance? What problems are there concerning its use? Consider: Changes in coverage; who would pay for loss of work if a disability occurred; why are lawyers against it.

Point out that each province has set its own minimum coverage standards.

Discussion Question: Some provinces require minimum liability insurance. How could this affect you in an accident?

Consider: Rising medical costs; rising court costs; increased insurance claims awarded; and so on.

**Private Passenger Automobile
Metropolitan Territory
Basic Rates
Financial Responsibility**

BODILY INJURY		PROPERTY DAMAGE		MEDICAL PAYMENTS	
Limits of Liability	Premiums	Limits of Liability	Premiums	Limits of Liability	Premiums
15/30	\$58	5M	\$30	\$500	\$10
20/40	\$62	10M	\$32	1M	\$12
25/50 ←	\$64	25M ↑	\$33	2M	\$14
50/100	\$70			5M	\$16
100/200	\$77				
100/300	\$75				

These are all thousands of dollars: 25/50 is \$25 000/\$50 000.

M means thousands.

table 20.4

EXAMPLE

Compute the liability premium for 15/30,5M coverage for a single male driver, age 22, living in a metropolitan area, and driving his car to and from work.

Use table 20.4 to find the basic premium.

15/30 bodily injury: \$58
 5M property damage: \$30
 Total basic premium: $\$58 + \$30 = \$88$

Use table 20.3 to find the rating factor.

Rating factor: 2.60

Multiply the total basic premium by the rating factor.

$2.60 \times \$88 = \228.30

- His liability insurance premium is \$228.30.

Point out that medical payments refer to passengers in the insured's car. Passengers in other vehicles are covered by bodily injury.

EXERCISES Compute the liability premiums for these insured car owners living in a metropolitan area.

COVERAGE

DRIVERS AND USE OF CAR

1. 15/30,5M Married man, age 48. Business use. Son, age 19, single, with driver's training. **\$171.60**
 2. 20/40,5M Single female, age 20, with driver's training. Pleasure use. **\$124.20**
 3. 25/50,5M Married man, age 28, drives to work. Wife, age 27. **\$122.20**
 4. 50/100,10M Single man, age 21. Pleasure use. **\$255.00**
 5. 100/200,25M Married man, age 24, drives to work. Wife, age 23. **\$143.00**
 6. 100/300,25M Married man, age 45. Business use. Wife, age 46. Son, age 18, single, with driver's training. **\$210.60**
- 7.–11. Find the liability premiums for the cars and drivers for problems 7 through 11 on page 271 if the coverage is 50/100,10M. 7. **\$132.60**; 8. **\$132.60**; 9. **\$265.10**; 10. **\$132.60**; 11. **\$193.80**

Suppose you have paid for your automobile insurance for a year and then decide to cancel it before the year is up. Do you know if you will get a refund? Do you know how much?

You do get a refund, but it is based on the premium for a short term policy. For example, if you cancel your policy after three months, you must pay for a 90-day policy. Although this is one-fourth of a year, the premium for this short term policy is higher than one-fourth of the annual premium. Your refund (also called *unearned premium*) is the difference between the premium you paid for your annual policy and the premium for a 90-day policy.

If the insured changes cars, he should transfer insurance coverage instead of taking a short rate cancellation.

Short Rate Cancellation Table

Days In Force	Returned Premium (Percent)	Days In Force	Returned Premium (Percent)	Days In Force	Returned Premium (Percent)
1	95	95-98	63	219-223	31
2	94	99-102	62	224-228	30
3-4	93	103-105	61	229-232	29
5-6	92	106-109	60	233-237	28
7-8	91	110-113	59	238-241	27
9-10	90	114-116	58	242-246	26
11-12	89	117-120	57	247-250	25
13-14	88	121-124	56	251-255	24
15-16	87	125-127	55	256-260	23
17-18	86	128-131	54	261-264	22
19-20	85	132-135	53	265-269	21
21-22	84	136-138	52	270-273	20
23-25	83	139-142	51	274-278	19
26-29	82	143-146	50	279-282	18
30-32	81	147-149	49	283-287	17
33-36	80	150-153	48	288-291	16
37-40	79	154-156	47	292-296	15
41-43	78	157-160	46	297-301	14
44-47	77	161-164	45	302-305	13
48-51	76	165-167	44	306-310	12
52-54	75	168-171	43	311-314	11
55-58	74	172-175	42	315-319	10
59-62	73	176-178	41	320-323	9
63-65	72	179-182	40	324-328	8
66-69	71	183-187	39	329-332	7
70-73	70	188-191	38	333-337	6
74-76	69	192-196	37	338-342	5
77-80	68	197-200	36	343-346	4
81-83	67	201-205	35	347-351	3
84-87	66	206-209	34	352-355	2
88-91	65	210-214	33	356-360	1
92-94	64	215-218	32	361-365	0

table 20.5

You can find your refund as a percentage of the premium for your annual policy. Look at table 20.5 above. It shows the number of days a policy was in effect, from 1 to 365. A percent is given with each. If the percent for 90 days is multiplied times your annual premium, the product would be your refund if you cancelled your policy after 90 days.

EXAMPLE

Jim took out an automobile insurance policy on March 3, 1976, with an annual premium of \$136. He cancelled the policy on October 10, 1976. Find his refund.

*Find the number of days between March 3 and October 10.
(Use table 13.1 on page 148.)*

October 10: 283

March 3: 62

Difference: $283 - 62 = 221$

Use table 20.5 to find the percent for 221 days.

31% for 219-223 days

Multiply the percent times the annual premium.

$0.31 \times \$136 = \42.16

■ His refund is \$42.16.

EXERCISES Find the short rate refunds for these cancelled policies.

	TOTAL ANNUAL PREMIUM	DATE POLICY PURCHASED	CANCELLATION DATE	
1.	\$248	January 15, 1972	July 6, 1972	\$104.16
2.	\$265	October 3, 1972	March 25, 1973	\$111.30
3.	\$193	March 1, 1973	November 15, 1973	\$44.39
4.	\$172	May 12, 1973	September 22, 1973	\$91.16
5.	\$109	August 1, 1974	February 3, 1975	\$42.51
6.	\$181	June 14, 1974	January 31, 1975	\$52.49
7.	\$109	September 5, 1975	April 10, 1976	\$34.88
8.	\$224	July 5, 1975	December 28, 1975	\$91.84
9.	\$256	April 2, 1976	November 25, 1976	\$71.68
10.	\$273	February 28, 1976	October 10, 1976	\$81.90
11.	\$215	August 3, 1977	December 24, 1977	\$107.50
12.	\$197	January 19, 1977	September 18, 1977	\$51.22
13.	\$189	October 23, 1978	March 28, 1979	\$88.83
14.	\$288	March 22, 1979	August 31, 1979	\$129.60
15.	\$303	September 12, 1979	April 23, 1980	\$90.90
16.	\$350	July 14, 1979	December 20, 1979	\$161.00

20 h / PRO-RATA POLICY CANCELLATIONS

Insurance companies also give pro-rata cancellations if coverage is transferred to another vehicle and a new, one-year policy is written.

Sometimes an insurance company cancels an insurance policy. Usually this happens if the company decides the policyholder is not a good risk. He may have been involved in too many accidents, or he may have an undesirable character, or he may have an arrest record for alcohol or narcotics offenses.

When the insurance company cancels (instead of the policyholder), they pay a pro-rated refund. The premium for each day the policy is in effect is $\frac{1}{365}$ of the annual premium. Table 20.6 shows these fractions of a year written as decimals ($\frac{1}{365} = 0.3205$).

table 20.6

Part of Year	Decimal	Part of Year	Decimal	Part of Year	Decimal	Part of Year	Decimal	Part of Year	Decimal	Part of Year	Decimal	Part of Year	Decimal
—1	0.0027	53	0.1452	105	0.2877	157	0.4301	209	0.5726	261	0.7151	313	0.8575
2	0.0055	54	0.1479	106	0.2904	158	0.4329	210	0.5753	262	0.7178	314	0.8603
3	0.0082	55	0.1507	107	0.2932	159	0.4356	211	0.5781	263	0.7205	315	0.8630
4	0.0110	56	0.1534	108	0.2959	160	0.4384	212	0.5808	264	0.7233	316	0.8658
5	0.0137	57	0.1562	109	0.2986	161	0.4411	213	0.5836	265	0.7260	317	0.8685
6	0.0164	58	0.1589	110	0.3014	162	0.4438	214	0.5863	266	0.7288	318	0.8712
7	0.0192	59	0.1616	111	0.3041	163	0.4466	215	0.5890	267	0.7315	319	0.8740
8	0.0219	60	0.1644	112	0.3068	164	0.4493	216	0.5918	268	0.7342	320	0.8767
9	0.0247	61	0.1671	113	0.3096	165	0.4521	217	0.5945	269	0.7370	321	0.8795
10	0.0274	62	0.1699	114	0.3123	166	0.4548	218	0.5973	270	0.7397	322	0.8822
11	0.0301	63	0.1726	115	0.3151	167	0.4575	219	0.6000	271	0.7425	323	0.8849
12	0.0329	64	0.1753	116	0.3178	168	0.4603	220	0.6027	272	0.7452	324	0.8877
13	0.0356	65	0.1781	117	0.3205	169	0.4630	221	0.6055	273	0.7479	325	0.8904
14	0.0384	66	0.1808	118	0.3233	170	0.4658	222	0.6082	274	0.7507	326	0.8932
15	0.0411	67	0.1836	119	0.3260	171	0.4685	223	0.6110	275	0.7534	327	0.8959
16	0.0438	68	0.1863	120	0.3288	172	0.4712	224	0.6137	276	0.7562	328	0.8986
17	0.0466	69	0.1890	121	0.3315	173	0.4740	225	0.6164	277	0.7589	329	0.9014
18	0.0493	70	0.1918	122	0.3342	174	0.4767	226	0.6192	278	0.7616	330	0.9041
19	0.0521	71	0.1945	123	0.3370	175	0.4795	227	0.6219	279	0.7644	331	0.9068
20	0.0548	72	0.1973	124	0.3397	176	0.4822	228	0.6247	280	0.7671	332	0.9096
21	0.0575	73	0.2000	125	0.3425	177	0.4849	229	0.6274	281	0.7699	333	0.9123
22	0.0603	74	0.2027	126	0.3452	178	0.4877	230	0.6301	282	0.7726	334	0.9151
23	0.0630	75	0.2055	127	0.3479	179	0.4904	231	0.6329	283	0.7753	335	0.9178
24	0.0658	76	0.2082	128	0.3507	180	0.4932	232	0.6356	284	0.7781	336	0.9205
25	0.0685	77	0.2110	129	0.3534	181	0.4959	233	0.6384	285	0.7808	337	0.9233
26	0.0712	78	0.2137	130	0.3562	182	0.4986	234	0.6411	286	0.7836	338	0.9260
27	0.0740	79	0.2164	131	0.3589	183	0.5014	235	0.6438	287	0.7863	339	0.9288
28	0.0767	80	0.2192	132	0.3616	184	0.5041	236	0.6466	288	0.7890	340	0.9315
29	0.0795	81	0.2219	133	0.3644	185	0.5068	237	0.6493	289	0.7918	341	0.9342
30	0.0822	82	0.2247	134	0.3671	186	0.5096	238	0.6521	290	0.7945	342	0.9370
31	0.0849	83	0.2274	135	0.3699	187	0.5123	239	0.6548	291	0.7973	343	0.9397
32	0.0877	84	0.2301	136	0.3726	188	0.5151	240	0.6575	292	0.8000	344	0.9425
33	0.0904	85	0.2329	137	0.3753	189	0.5178	241	0.6603	293	0.8027	345	0.9452
34	0.0932	86	0.2356	138	0.3781	190	0.5205	242	0.6630	294	0.8055	346	0.9479
35	0.0959	87	0.2384	139	0.3808	191	0.5233	243	0.6658	295	0.8082	347	0.9507
36	0.0986	88	0.2411	140	0.3836	192	0.5260	244	0.6685	296	0.8110	348	0.9534
37	0.1014	89	0.2438	141	0.3863	193	0.5288	245	0.6712	297	0.8137	349	0.9562
38	0.1041	90	0.2466	142	0.3890	194	0.5315	246	0.6740	298	0.8164	350	0.9589
39	0.1068	91	0.2493	143	0.3918	195	0.5342	247	0.6767	299	0.8192	351	0.9616
40	0.1096	92	0.2521	144	0.3945	196	0.5370	248	0.6795	300	0.8219	352	0.9644
41	0.1123	93	0.2548	145	0.3973	197	0.5397	249	0.6822	301	0.8247	353	0.9671
42	0.1151	94	0.2575	146	0.4000	198	0.5425	250	0.6849	302	0.8274	354	0.9699
43	0.1178	95	0.2603	147	0.4027	199	0.5452	251	0.6877	303	0.8301	355	0.9726
44	0.1205	96	0.2630	148	0.4055	200	0.5479	252	0.6904	304	0.8329	356	0.9753
45	0.1233	97	0.2658	149	0.4082	201	0.5507	253	0.6932	305	0.8356	357	0.9781
46	0.1260	98	0.2685	150	0.4110	202	0.5534	254	0.6959	306	0.8384	358	0.9808
47	0.1288	99	0.2712	151	0.4137	203	0.5562	255	0.6986	307	0.8411	359	0.9836
48	0.1315	100	0.2740	152	0.4164	204	0.5589	256	0.7014	308	0.8438	360	0.9863
49	0.1342	101	0.2767	153	0.4192	205	0.5616	257	0.7041	309	0.8466	361	0.9890
50	0.1370	102	0.2795	154	0.4219	206	0.5644	258	0.7068	310	0.8493	362	0.9918
51	0.1397	103	0.2822	155	0.4247	207	0.5671	259	0.7096	311	0.8521	363	0.9945
52	0.1425	104	0.2849	156	0.4274	208	0.5699	260	0.7123	312	0.8548	364	0.9973
												365	1.0000

To compute a refund

- find the number of days the policy was in effect,
- use table 20.6 to find the decimal that represents this part of a year,
- multiply the decimal times the annual premium,
- subtract the product from the annual premium.



EXAMPLE

A policy with an annual premium of \$103 is taken out on March 25, 1975. The policy is cancelled by the insurance company on September 30, 1975. Find the refund.

Find the number of days between March 25 and September 30. (Use table 13.1 on page 148.)

September 30: 273
 March 25: 84
 Difference: $273 - 84 = 189$

Use table 20.6 to find the decimal equivalent to $189/365$.

$$189/365 = 0.5178$$

Multiply the decimal times the annual premium.

$$0.5178 \times \$103 = \$53.33$$

Subtract the product from the annual premium.

$$\$103.00 - \$53.33 = \$49.67$$

- The refund is \$49.67.

Project: Visit several automobile insurance companies. Find out what different reasons they have for cancelling insurance policies. What percent of their cancellations are for drunken driving? For undesirable character? What does "undesirable character" include?

EXERCISES Find the pro-rata refunds for these policies cancelled by the insurance company.

	TOTAL ANNUAL PREMIUM	DATE POLICY PURCHASED	CANCELLATION DATE	
1.	\$248	January 15, 1972	July 6, 1972	\$130.45
2.	\$265	October 3, 1972	March 25, 1973	\$139.39
3.	\$193	March 1, 1973	November 15, 1973	\$56.05
4.	\$172	May 12, 1973	September 22, 1973	\$109.32
5.	\$109	August 1, 1974	February 3, 1975	\$53.45
6.	\$181	June 14, 1974	January 31, 1975	\$66.45
7.	\$109	September 5, 1975	April 10, 1976	\$43.89
8.	\$224	July 5, 1975	December 28, 1975	\$115.99
9.	\$256	April 2, 1976	November 25, 1976	\$89.78
10.	\$273	February 28, 1976	October 10, 1976	\$104.72
11.	\$215	August 3, 1977	December 24, 1977	\$130.76
12.	\$197	January 19, 1977	September 18, 1977	\$66.39
13.	\$189	October 23, 1978	March 28, 1979	\$108.22
14.	\$288	March 22, 1979	August 31, 1979	\$160.19
15.	\$303	September 12, 1979	April 23, 1980	\$117.05
16.	\$350	July 14, 1979	December 20, 1979	\$197.54

17. Compare your answers to the problems above to the answers to the problems on page 275.

CHECKLIST

Automobile financing (p. 266)
Average unpaid balance (p. 266)
Basic premium (p. 268)
Bodily injury (p. 272)
Cancellation date (p. 275)
Cash selling price (p. 262)
Cash unpaid balance (p. 262)
Claim (p. 268)
Code (p. 269)
Collision (p. 268)
Comprehensive (p. 268)
Contract unpaid balance (p. 264)
Down payment (p. 262)
Effective date (p. 275)
Finance charge (p. 262)
Finance payment chart (p. 265)
Financial responsibility (p. 272)
Flat rate (p. 262)
Maintenance sheet (p. 263)
Liability (p. 272)
Monthly payment (p. 264)
Physical damage (p. 268)
Premium (p. 268)
Property damage (p. 272)
Pro-rata cancellation (p. 276)
Rating factor (p. 270)
Short rate cancellation (p. 274)
Simple interest rate (p. 266)
Trade-in allowance (p. 262)
Underwriting factor (p. 268)
Unearned premium (p. 274)

PROBLEMS

In problems 1 through 6, find the amount of each monthly payment to finance the automobile.

1. Quinella agrees to buy a Chevrolet Impala for \$2725 plus 5% sales tax. She is allowed a trade-in of \$500 on her Chevrolet Chevelle, and she makes a cash down payment of \$600. Her contract is for 18 monthly payments at a flat rate of 1% per month. **\$115.46**
2. Herbert buys a Pontiac Firebird for \$3250 plus 3% sales tax. He makes no cash down payment but is allowed \$1000 on his Pontiac Catalina trade-in. His

contract is for 24 monthly payments at a flat rate of $\frac{3}{4}\%$ per month. **\$115.42**

3. Effie makes an \$800 down payment on a Ford Mustang that sells for \$1295 plus 4% sales tax. Her contract is for 6 monthly payments at a flat rate of $1\frac{1}{2}\%$ per month. **\$99.34**
4. Godfrey buys a Plymouth Fury for \$995 plus 5% sales tax. He makes a cash down payment of \$400 and will pay the balance in 12 monthly payments at a flat rate of 1% per month. **\$60.18**
5. William turns in his Ford Fairlane on a Chrysler Imperial that costs \$1995 plus 4% sales tax. He makes a cash down payment of \$500 and is allowed \$50 trade-in on his Ford. The contract is for 18 monthly payments at a flat rate of $1\frac{1}{2}\%$ per month. **\$107.58**
6. Gertrude purchases a Volkswagen station wagon for \$895 plus 5% sales tax. She makes a down payment of \$250 and signs a contract to pay the balance in 15 monthly installments at a flat rate of 1% per month. **\$52.88**

In problems 7 through 12, find the approximate rate of simple interest per year to finance the installment sales contracts.

7. Hyvis purchased a Ford with a cash unpaid balance of \$650 and a finance charge of \$72.50. The contract is for 12 monthly payments. **23.2%**
8. Celia purchased a Chevrolet with a contract unpaid balance of \$1005. Her cash unpaid balance was \$880 and the contract was for 15 monthly payments. **22.7%**
9. Phillip bought a Plymouth with a cash unpaid balance of \$1200 to be paid in 18 monthly payments of \$77.94 each. **22.5%**
10. Jeannette signed a 21-month contract to finance a cash unpaid balance of \$1500 for a finance charge of \$225. **17.1%**
11. Robert signed an installment sales contract with 22 monthly payments for a contract unpaid balance of \$2187 to finance a cash unpaid balance of \$1750. **27.2%**
12. Helga financed a cash unpaid balance of \$2000 with 24 monthly payments of \$98.33 each. **18%**

In problems 13 through 18, compute the automobile insurance premiums for one year. Use the rates for a metropolitan area.

13. Seth has a Mercury Montclair with code M-3. He is single, age 25, and drives the car to and from work. His coverage is comprehensive, \$100 deductible collision, 15/30 bodily injury, and 5M property damage. **\$267.00**
14. Marcella drives a Dodge Challenger with code P-3. She is single, age 23, and uses the car for pleasure only. Her coverage is comprehensive, \$50 deductible collision, and 20/40,10M financial responsibility. **\$295.20**
15. Myron is married, age 45, and drives his car to and from work. His wife, age 44, also drives for pleasure. His son, age 19, single, with driver's training, uses the car occasionally for pleasure. The car, an Oldsmobile with code N-3, is insured only for comprehensive, 25/50 bodily injury, and 10M property damage. **\$253.50**
16. Polly insures only for financial responsibility with limits of 15/30,5M. She is single, age 22, and drives the car, code C-4, to and from work. **\$114.40**
17. Penrod has a Thunderbolt with code Z-1. He is insured for comprehensive and \$100 deductible collision. He is married, age 21, and drives to and from work. His wife also uses the car for pleasure. She is 18 and has completed driver's training. **\$218.40**
18. Leona has a Datsun with code J-1. She is married, age 23, and drives to and from work. Her husband, age 23, is an occasional driver. She has comprehensive, \$100 deductible collision, and 15/30,5M financial responsibility. **\$228.80**

In problems 19 through 24, determine whether the cancellation should be short rate or pro-rata. Then compute the return premium.

19. Nita was arrested twice for driving while intoxicated. The insurance company decided to cancel her insurance. The annual premium was \$156. The effective date of the cancellation was January 15, 1972 and the policy expiration date was October 1, 1972. **\$110.70**
20. Della exchanged her old car for a new one and requested her insurance company to transfer the

coverage to her new car. The company offered to cancel the policy and write a new policy for the new car. Her policy on the old car expired on December 15, 1973 and the date she exchanged cars was October 12, 1973. The annual premium was \$173. **\$24.22**

21. Buzzwell sold his car because he couldn't afford to support it. He requested his insurance company to cancel the policy. The annual premium was \$182, the date of cancellation was March 4, 1973, and the expiration date of the policy was August 11, 1973. **\$63.70**
22. Regina was arrested for using narcotics. The insurance company elected to cancel her policy. The policy was for one year beginning April 3, 1974 and the premium was \$195. The effective date of the cancellation was June 28, 1974. **\$149.06**
23. Marcia's brother got a job as an insurance salesman and Marcia decided to let him write a policy for her car. She requested cancellation of her old policy, which would expire on May 19, 1975. The premium was \$169 and the effective date for the cancellation was January 22, 1975. **\$42.25**

QUESTIONS

1. What kinds of automobile risks do these coverages insure against?
 - (a) Physical damages
 - (b) Financial responsibility
2. What is comprehensive insurance?
3. What underwriting factors are taken into consideration when an applicant applies for an automobile insurance policy?
4. From looking at the table for automobile insurance rating factors, what group of drivers has the most accidents and insurance claims?
5. What does 25/50,5M refer to in automobile insurance?
6. Why are the rates for \$50 deductible collision higher than those for \$100 deductible collision?
7. Who initiates a short rate insurance policy cancellation?
8. If the flat rate per month is 1%, what is the flat rate per year?
9. If the flat rate per month is 1%, what is the approximate rate expressed in simple interest per year?

Research/Discuss

- *They use mortality tables (statistics about the number of deaths per age) to determine the amount of premium that will be needed to pay the claims for all their policyholders. To this amount is added the "load," that is, the amount necessary to operate the company.*
- *There is no limit other than the insured's ability to pay the premium. If a very large policy is written by any one company, that*

CHAPTER 21

- company may reinsure its risk with other companies.*
- *Piloting crop dusting airplanes, law enforcement, structural steel work, fire-fighting, test piloting aircraft, mining, and skindiving are all dangerous occupations.*
- *A person is eligible as soon as he is born. However, there are usually limitations on the death claim if death occurs during the first year. Most companies will not write a policy on anyone over age 70. Those who are accepted over age 55 must be in good health and in nonhazardous occupations. The premiums are very high at the older ages because the life expectancies are shorter.*
- *You must be in good health to get a life insurance policy at standard rates. Persons with impaired health must pay a higher premium (rated premium) if they are accepted for insurance.*

LIFE INSURANCE

RESEARCH/DISCUSS

- How do life insurance companies determine how much premium to charge for a policy?
- What is the highest amount of insurance that a person can buy?
- People with dangerous occupations may be denied insurance. What are some of the most dangerous civilian occupations?
- How old do you have to be to qualify for a life insurance policy? What is the age limit for obtaining life insurance?
- What effect does your health have on your application for a life insurance policy?

IN THIS CHAPTER YOU WILL LEARN . . .

- what factors determine the cost of life insurance
- how life insurance premiums are computed
- the different ways life insurance policies can be used
- how cash values can be used
- how to figure the net cost or net gain of life insurance policies
- about mortality tables

1. PROPOSED INSURED

FULL NAME Charles Harold O'Brien Male ☒ Fem. ☐
 DATE AND PLACE OF BIRTH Mo: 7 Day: 14 Yr: 45 State or Prov. and Country Toronto, Ontario, Canada
 ADDRESS Number 436 St. or Rt. Jefferson City or Town Harper County Harper State or Province Harper Time at Address 8 Yrs. 2 Mos.
 Residence 436 Harper 8 Yrs. 2 Mos.
 Business 436 Harper 8 Yrs. 2 Mos.
 FIRM OR EMPLOYER J.W. Gordon and Company
 PRESENT OCCUPATION(S) (Include Pay Grade if in Mil. Serv.) Salesman
 DUTIES OF OCCUPATION(S) Sales of oil drilling equipment
 PREVIOUS OCCUPATION(S) within last 2 years

2. LIFE POLICY APPLIED FOR

PLAN AND AMOUNT
\$20,000 Ordinary Life
 POLICY TO BE DATED Date policy issued ☒ Other 19
 PREMIUM MODE Mthly ☐ Qtrly ☐ Semi ☒ Anni ☐ Govt ☐

3. BENEFICIARY

BENEFICIARY, subject to change. Full Name & Relationship to Proposed Insured
Louise, Laura O'Brien
wife

4. OWNER

LIFE POLICY OWNER Proposed Insured ☒ Applicant ☐
 Applicant before policy anniversary when Proposed Insured's age, nearest birthday, is 21, then Proposed Insured. ☐
 Other: Full Name Louise, Laura O'Brien Relationship to Proposed Insured wife
 LIFE OWNER'S DESIGNEE Proposed Insured ☒ No Designee ☐
 Other: Full Name Louise, Laura O'Brien Relationship to Proposed Insured wife

5. APPLICANT (ANSWER IF NOT THE PROPOSED INSURED)

FULL NAME Charles H. O'Brien
 Male ☐ Fem. ☐ Date of Birth Mo. 7 Day 14 Yr. 45
 Relationship to Proposed Insured Proposed Insured
 ADDRESSES (Give No., St. or Rt., City or Town, County, State or Prov., Zip Code)
 Residence 436 Harper 8 Yrs. 2 Mos.
 Time at Address 436 Harper 8 Yrs. 2 Mos.
 Business 436 Harper 8 Yrs. 2 Mos.
 Time at Address 436 Harper 8 Yrs. 2 Mos.
 FIRM OR EMPLOYER J.W. Gordon and Company
 OCCUPATION(S) AND DUTIES Salesman
 TOTAL LIFE INSURANCE IN FORCE (If none, say "none") \$

6. ANSWER WITH RESPECT TO ALL PERSONS PROPOSED FOR COVERAGE

To the best of knowledge and belief, has any person proposed for coverage

	Yes	No
(a) within the last year, been admitted or been advised to be admitted to a hospital, sanitarium, or other similar institution other than for childbirth?	☐	☒
(b) ever consulted a physician for heart disease, stroke, elevated blood pressure or cancer or had an electrocardiogram made because of palpitation or chest discomfort?	☐	☒
(c) been declined, within last 5 years, for issue, reinstatement, or renewal of any type of Life or Health insurance? (If "Yes", give name of person, companies and other details below.)	☐	☒
(d) been offered, within last 5 years, a policy on issue, reinstatement or renewal which was different from that applied for? (If "Yes", give name of person, companies and other details below.)	☐	☒
(e) engaged in within last 2 years, or intend to engage in, skin diving, motor vehicle or motorcycle racing, sky diving, or any other hazardous sport or hobby? (If "Yes", complete Form 5673.)	☐	☒
(f) flown within last 2 years, or intend to fly, as a pilot, student pilot or other crew member of any kind of aircraft? (If "Yes", complete Form 9574.)	☒	☐
(g) resided within last 2 years, or expect to reside or travel, outside the United States and Canada in either a civilian or military capacity? (If "Yes", state who, where, when and how long.)	☐	☒

REPLACEMENT INQUIRY: is the policy(s) applied for intended to replace, in whole or in part, Life Insurance in force in this or any other company? (If "Yes", give name of company, replacement date, amount of benefit replace, plan and policy number, if known.) ☐ ☒

IT IS MUTUALLY AGREED THAT:

- The undersigned agree that the written representations in this application are correctly recorded, complete and true and that the Company, believing them to be true, shall rely and act upon them accordingly.
- The undersigned confirm all agreements included in such application and agree that acceptance by the Applicant of any policy issued thereon shall constitute ratification of such agreements and of any amendments and corrections made by the Company.
- No Field Underwriter or other agent of the Company, nor any medical examiner, is authorized to accept risks, pass upon insurability, make or modify contracts or waive any of the Company's rights or requirements.
- Except as provided in the receipt given for cash and bearing the same date and number as Part I of this application, no policy applied for herein shall go into force or take effect unless the first premium for it is paid in full during the lifetime of the person proposed for coverage under it, and then only if the written representations made in the entire application for insurance would be, without material change, at time of delivery of the policy, true and complete representations of the state, at that time, of those matters inquired about in such application.

Applicant Charles H. O'Brien
 Proposed Insured* if other than Applicant Charles H. O'Brien
 Proposed Insured's Spouse Charles H. O'Brien
 if proposed for life coverage
 Dated at Toronto, Ontario on August 4 1975
 Witnessed by John Q. Harrison Field Underwriter
 Countersigned by John Q. Harrison
 Licensed resident agent where required by statute or regulation.

Most men take out some kind of insurance policy to provide for their dependents if they should die or become permanently disabled.

① Mr. O'Brien decided a \$20 000 ordinary life policy would best suit his needs.

② He decides to pay the annual premium in two installments—semi-annually.

③ Mr. O'Brien names his wife as beneficiary—she will receive the \$20 000 if he dies.

④ Sometimes a husband takes out insurance on his wife, or one partner in a business firm takes

out a policy on another partner. In such a case, this information must be supplied.

⑤ A "yes" answer to any of these questions might affect the coverage the company is willing to supply. Here, the information on Form 9574 will help the company decide whether Mr. O'Brien is too great a risk.

⑥ Mr. Harrison is the agent who sold the policy. After this application is approved and the first premium paid, Mr. O'Brien will receive his policy.

21 a / KINDS OF LIFE INSURANCE

If possible, have students bring insurance policies to class for inspection and discussion.

During your lifetime you will undoubtedly face the risk of loss. This loss could come about as a result of fire, theft or accident in the case of physical possessions, or it could be a loss of life and earning power in the case of individuals.

Any of the above losses could mean a large financial burden for you or any other member of your family. To prevent you from facing this burden alone, we depend on many types of insurance. When an insured person pays a certain amount of money to a common fund, financial burdens may be avoided at times of loss.

Life insurance operates on the above principle.

Life insurance provides money for the future—either for your beneficiaries or for yourself. If you die, your beneficiaries will get the money; if you live for a certain length of time, you will get the money. Thus, life insurance provides money for your dependents, but can also provide a savings program for you. Life insurance policies can also be used for other purposes: To provide money for education. To pay a mortgage. To add to your retirement income.

However, the primary purpose of life insurance is to provide financial protection for your dependents in case you die prematurely.

The cost of life insurance depends on several factors.

- (1) Your age when the policy is written.

Older person → Shorter life expectancy → Higher premium

- (2) The kind of policy you choose.

Higher return → Higher premium

- (3) The amount of the policy you choose.

Larger policy → Larger premium

- (4) Your health when the policy is written.

Physical impairment → Higher premium

- (5) Your job when the policy is written.

Dangerous job → Higher premium

There are several kinds of life insurance policies available. For *ordinary life* (also called *whole life* or *straight life*), premiums are payable until death or age 99. *Twenty payment life* (called *limited payment* insurance) and *twenty year endowment* have twenty annual premiums, then they are paid in full. Endowment policies differ from other life insurance policies in that if you live until the payments are completed, you receive the amount of the policy. *Term* insurance is like automobile insurance. It is not a savings plan. If you survive the length of the term (say 10 years), the insurance company keeps the entire premium and pays nothing.

Discuss these factors in more detail, giving examples of each. Mention which types of people cannot get life insurance policies.

Obtain copies of an insurance policy application and discuss the various questions on it.

Emphasize the differences between 20 payment life and 20 year endowment. With 20 payment life, after 20 payments, you have a paid-up policy. With 20 year endowment, after 20 years, you receive the amount of the policy.

Project: Ask a relative or friend what kind of life insurance he has, if any. Find out why he purchased that kind.

Annual Prepaid Premiums Per \$1000 Life Insurance

Age At Issue	5 Year Term	Ordinary Life	20 Payment Life	20 Year Endowment
16	\$4.35	\$9.66	\$17.20	\$22.62
17	\$4.40	\$9.97	\$17.66	\$23.14
18	\$4.46	\$10.30	\$18.13	\$23.68
19	\$4.52	\$10.63	\$18.61	\$24.24
20	\$4.58	\$10.98	\$19.10	\$24.82
21	\$4.63	\$11.35	\$19.59	\$25.42
22	\$4.69	\$11.72	\$20.10	\$26.03
23	\$4.74	\$12.11	\$20.62	\$26.66
24	\$4.79	\$12.52	\$21.15	\$27.31
25	\$4.85	\$12.94	\$21.69	\$27.98

table 21.1

Table 21.1 is used to find the annual premium for a life insurance policy. It shows the premiums for \$1000 of various kinds of life insurance issued at various ages. The kinds of policies shown are ordinary life, 20 payment life, 20 year endowment, and 5 year term.

EXAMPLE

Find the annual premium for a \$10 000 ordinary life policy issued at age 19. *Find the premium for \$1000 ordinary life at age 19.*

Premium per \$1000 = \$10.63

Since \$10 000 is 10 times \$1000, multiply the premium for \$1000 by 10.

$$10 \times \$10.63 = \$106.30$$

- The annual premium is \$106.30.

EXAMPLE

Find the annual premium for a \$1500 twenty year endowment policy issued at age 23.

Find the premium for \$1000 twenty year endowment at age 23.

Premium per \$1000 = \$26.66

Since \$1500 is 1.5 times \$1000, multiply the premium for \$1000 by 1.5

$$1.5 \times \$26.66 = \$39.99$$

- The annual premium is \$39.99.

Find the annual premiums for these life insurance policies.

AGE AT			AGE AT		
POLICY	AMOUNT	ISSUE	POLICY	AMOUNT	ISSUE
1. Ordinary life	\$2000	17	2. 20 payment life	\$5000	19
3. 5 year term	\$3000	18	4. 20 year endowment	\$6000	20
5. Ordinary life	\$8000	21	6. 5 year term	\$7000	19
7. 20 payment life	\$4000	24	8. 20 year endowment	\$5000	23
9. Ordinary life	\$6500	25	10. 5 year term	\$10 700	24
11. 20 payment life	\$12 200	17	12. 20 year endowment	\$1800	22
13. Ordinary life	\$10 750	18	14. 20 year endowment	\$1750	23
15. Ordinary life	\$10 250	25	16. Ordinary life	\$15 350	18

Call attention to the lower cost of term insurance and the higher cost of endowment insurance. Discuss the reasons for this price difference.

Discussion Question: What is group insurance? What are the advantages to the employee? To the employer? Are there any disadvantages?

Consider: Type and duration of protection; convertibility; requirements for employees for application; payment of premiums; and so on.

Answers to Exercises

- | | |
|-------------|--------------|
| 1. \$19.94 | 9. \$84.11 |
| 2. \$93.05 | 10. \$51.25 |
| 3. \$13.38 | 11. \$215.45 |
| 4. \$148.92 | 12. \$46.85 |
| 5. \$90.80 | 13. \$110.73 |
| 6. \$31.64 | 14. \$46.66 |
| 7. \$84.60 | 15. \$132.64 |
| 8. \$133.30 | 16. \$158.11 |

Point out that there is a way to make monthly payments on an insurance policy but avoid the 6% additional charge. If you want a \$12 000 policy, just take out twelve \$1000 policies—one each month for a year. Then, each month the annual premium will be due on one of the policies. Thus you will be making monthly payments, but each monthly payment is an annual premium so there is no additional charge. Compare the annual cost for these twelve policies with the annual cost of one \$12 000 policy paid by monthly payments.

For a small additional charge, annual premiums can be paid by semi-annual (twice a year), quarterly (four times a year), or monthly (twelve times a year) payments. The usual charge for semi-annual payments is 2% of the annual premium; for quarterly payments, 4% of the annual premium; and for monthly payments, 6% of the annual premium. The semi-annual payment can be computed by taking 51% of the annual premium; the quarterly payment by taking 26% of the annual premium; and the monthly payment by taking 8.83% of the annual premium.

EXAMPLE

Find the semi-annual payment for a \$10 000 ordinary life policy issued at age 24.

Find the annual premium for \$10 000 from table 21.1.

$$10 \times \$12.52 = \$125.20$$

Multiply the annual premium by 0.51.

$$0.51 \times \$125.20 = \$63.85$$

■ Each semi-annual payment is \$63.85.

EXERCISES Find the amount of each payment for these policies.

POLICY	AMOUNT	AGE AT ISSUE	PAYMENT	
1. Ordinary life	\$1000	16	Semi-annually	\$4.93
2. Ordinary life	\$2000	18	Quarterly	\$5.36
3. 5 year term	\$5000	19	Semi-annually	\$11.53
4. 5 year term	\$5400	21	Quarterly	\$6.50
5. 20 payment life	\$10 000	24	Semi-annually	\$107.87
6. 20 payment life	\$11 000	25	Quarterly	\$62.03
7. 20 year endowment	\$12 500	25	Semi-annually	\$178.37
8. Ordinary life	\$9000	22	Quarterly	\$27.42
9. Ordinary life	\$7500	21	Semi-annually	\$43.41
10. Ordinary life	\$8500	20	Quarterly	\$24.27
11. Ordinary life	\$7200	24	Semi-annually	\$45.97
12. 20 payment life	\$6000	25	Quarterly	\$33.84
13. Ordinary life	\$10 000	23	Monthly	\$10.69
14. Ordinary life	\$9250	18	Monthly	\$8.42
15. Ordinary life	\$7750	16	Monthly	\$6.11
16. Ordinary life	\$15 000	17	Monthly	\$13.21

21 C / INSURANCE FOR A BUDGETED SUM

Suppose you have a certain amount of money for a life insurance policy. How can you find the amount of life insurance that your money will buy? You can use a proportion.

$$\frac{\text{Amount of coverage}}{\text{Premium you want to pay}} = \frac{\$1000}{\text{Premium for \$1000}}$$

EXAMPLE

Find the amount of ordinary life insurance that an annual premium of \$100 will buy at age 19.

Find the annual premium for ordinary life at age 19.

Premium for \$1000 = \$10.63

Divide \$1000 by the premium for \$1000.

$\$1000 \div \$10.63 = \$94.07$

Multiply \$94.07 by the premium you want to pay. (\$100)

$\$94.07 \times \$100 = \$9407$

- An annual premium of \$100 will buy a \$9407 life insurance policy at age 19.

Discussion Question. What should you consider before buying an insurance policy?

Consider: Getting advice from a qualified insurance adviser; how much money you can afford for premiums, what needs must be met by the insurance money – family protection, savings, retirement, funeral expenses, education, and so on; what type of insurance best meets these needs.

Project: Prepare a list of hazardous occupations and find out from an insurance company which, if any, require a higher premium for occupational reasons.

EXERCISES Find the amount of life insurance that these premiums will buy.

	ANNUAL BUDGET		POLICY	AGE AT ISSUE	PAYMENT PERIOD
1.	\$50	\$4921.26	Ordinary life	17	Semi-annually
2.	\$60	\$5597.01	Ordinary life	18	Quarterly
3.	\$75	\$6696.43	Ordinary life	20	Semi-annually
4.	\$75	\$3683.69	20 payment life	21	Quarterly
5.	\$75	\$15 991.47	5 year term	22	Annually
6.	\$80	\$16 393.44	5 year term	24	Semi-annually
7.	\$100	\$9407.34	Ordinary life	19	Annually
8.	\$100	\$9225.09	Ordinary life	19	Semi-annually
9.	\$100	\$9057.97	Ordinary life	19	Quarterly
10.	\$100	\$8861.70	Ordinary life	19	Monthly
11.	\$100	\$4975.12	20 payment life	22	Annually
12.	\$100	\$4878.05	20 payment life	22	Semi-annually
13.	\$100	\$4780.11	20 payment life	22	Quarterly
14.	\$100	\$4706.21	20 payment life	22	Monthly
15.	\$200	\$15 456.00	Ordinary life	25	Semi-annually
16.	\$250	\$51 546.00	5 year term	25	Quarterly

Project: Find out the interest rates on loans made on the cash value of a life insurance policy. How do they compare with loans from banks? from trust companies? from credit unions?

Point out that unless the insured makes a choice, number four automatically takes effect when premiums are not paid when due.

Every life insurance policy, except term insurance has *cash value* if it has been in effect for a certain period of time (usually at least two years). There are four ways to use the cash value.

- (1) You can borrow all or any part of the cash value for an indefinite period of time. You must pay interest on the loan, but the interest rates are much lower than for any other kind of loan. The life insurance remains in effect as long as you pay both the premiums and the interest on the loan.
- (2) If you decide that you don't need the policy or if you can't keep up the payments, you can surrender it for its cash value. The policy is then void.
- (3) If you want to quit making payments, but still have some life insurance, you can buy a paid-up policy. The amount of the paid-up policy depends on your age and the cash value of your former policy. The paid-up policy has no more premium payments, and you still have access to the cash value.
- (4) If you can't keep up the payments, but still need a maximum amount of insurance, you can use the cash value to buy extended term insurance. The extended term insurance is paid-up for a specific number of years, months, and days, after which it is expired.

The technical name for cash value is *nonforfeiture value*. Every life

**Guaranteed Cash Values Per \$1000
Ordinary Life**

Age at Issue	End of 5 Years	End of 10 Years	End of 15 Years	End of 20 Years	At Age 65
16	\$13	\$58	\$109	\$183	\$603
17	\$14	\$60	\$114	\$189	\$600
18	\$15	\$63	\$118	\$196	\$597
19	\$17	\$66	\$123	\$203	\$594
20	\$18	\$70	\$129	\$209	\$591
21	\$20	\$73	\$134	\$217	\$587
22	\$21	\$76	\$140	\$224	\$584
23	\$23	\$80	\$145	\$231	\$580
24	\$24	\$84	\$151	\$239	\$576
25	\$26	\$88	\$157	\$246	\$571
26	\$28	\$92	\$163	\$254	\$567
27	\$30	\$96	\$170	\$262	\$562
28	\$32	\$100	\$176	\$270	\$557
29	\$34	\$105	\$182	\$278	\$552
30	\$36	\$109	\$189	\$287	\$547

table 21.2

insurance policy, except term insurance, has a table showing these values both by categories and by years that the policy is in effect. Table 21.2 shows the cash values per \$1000 of face value for ordinary life policies issued at various ages for selected time intervals.

The cash value of a policy for more than \$1000 is proportional to the value given in the table. For example, the cash value of a \$10 000 policy is 10 times the cash value of a \$1000 policy. To find the cash value of a life insurance policy, we need to know the age at which the policy was issued and the number of years that the policy has been in effect. Also, we need to know the face amount of the policy if it is not for \$1000.

Mention that a lapsed policy should always be checked for its cash value before it is discarded. (Except for term insurance.)

EXAMPLE

Find the cash value of a \$1000 ordinary life policy issued at age 18, when the policy has been in effect for 10 years.

Use table 21.2 to find the intersection of the line for 18 years and the column for 10 years.

- The cash value is \$63.

EXAMPLE

Find the cash value of a \$10 000 ordinary life policy issued at age 30, when the policy has been in effect for 15 years.

Find the cash value per \$1000.

The intersection of 30 years and 15 years is \$189.

Multiply to find the cash value for a \$10 000 policy.

$10 \times \$189 = \1890

- The cash value is \$1890.

EXERCISES Find the cash values for these ordinary life policies.

AMOUNT OF POLICY	AGE AT ISSUE	YEARS IN EFFECT	AMOUNT OF POLICY	AGE AT ISSUE	YEARS IN EFFECT
1. \$1000	16	5 \$13.00	2. \$5000	19	10 \$330.00
3. \$3000	21	5 \$60.00	4. \$7000	24	15 \$1057.00
5. \$9000	22	10 \$684.00	6. \$8000	17	20 \$1512.00
7. \$9000	20	10 \$2310.00	8. \$10 000	23	15 \$1450.00
9. \$10 000	23	20 \$2310.00	10. \$12 000	25	5 \$312.00
11. \$12 000	25	10 \$1056.00	12. \$12 000	25	15 \$1884.00
13. \$15 500	30	10 \$1689.50	14. \$15 500	30	20 \$4448.50
15. \$15 500	30	35 (age 65) \$8478.50	16. \$15 750	25	40 (age 65) \$8993.25

21 e / NET COST AND NET GAIN

Mention that higher premium policies will show greater net gains than ordinary life policies.

Point out that the \$204 net cost divided by 20 years equals an annual net cost of \$10.20. This is less than \$1.00 per month for \$10 000 worth of life insurance.

When you buy life insurance, the salesman will often show you the *net cost* or *net gain* when the policy is held for at least 20 years. It is found by comparing the cash value of the policy and the total amount of the premiums paid. The net cost or net gain does not take into account the amount of interest you lose on the premiums. However, this is fairly reasonable since you get insurance protection in addition to cash value.

EXAMPLE

Find the net cost of a \$10 000 ordinary life policy issued at age 30 if the policy is held to age 50.

Multiply the annual premium by the number of years the policy is held.

$$\text{Annual premium} = 10 \times \$15.37 = \$153.70$$

$$20 \times \$153.70 = \$3074$$

Find the cash value of the policy. (Use table 21.2.)

$$10 \times \$287 = \$2870$$

Compare the total premiums and the cash value.

Total premiums	\$3074
----------------	--------

Cash value	— 2870
------------	--------

Net cost	\$ 204
----------	--------

- The net cost of the policy is \$204.

EXAMPLE

Find the net cost (or net gain) of the policy in the example above if the policy is held to age 65.

Find the total premiums.

$$35 \times \$153.70 = \$5379.50$$

Find the cash value at age 65.

$$10 \times \$547 = \$5470$$

Compare the total premiums and the cash value.

Cash value	\$5470.00
------------	-----------

Total premiums	— 5379.50
----------------	-----------

Net gain	\$ 90.50
----------	----------

- The net gain of the policy is \$90.50.

Thus, if the insurance policy above is kept for 20 years the amount paid in premiums is *greater* than the cash value. So the policy costs the policyholder \$204. However, if the policy is kept for 35 years, the amount paid in premiums is *less* than the cash value. In this case, the policyholder *gains* \$90.50.

FACT AND FIGURES

Canadians rank third in life insurance ownership in the world. The citizens of the United States and Japan own more life insurance. On a per capita basis, ownership of life insurance by Canadians ranks second, after that of the people of the United States. Canadians own an average of \$6700; Americans, \$7700. At the end of 1972 Canadians owned \$145 billion dollars of life insurance. This is 3.1 times the amount owned in 1960.

There are 161 active life insurance companies in Canada—83 Canadian incorporated, 62 United States, 9 British, and 7 European.

The total premium income in Canada of all life insurance companies during 1972 was \$2391 million. In comparison the 1960 total was \$953 million.

In 1972, benefit and dividend payments to Canadians totalled \$1447 million, or approximately \$28 million a week. Of the \$1447 million total in 1972, 61 percent was paid out under individual life insurance policies, and 39 percent under group plans.

Source: Facts '73, Canadian Life Insurance Association, 44 King Street West, Toronto.

Facts & Figures

Where does Canada rank in life insurance ownership on a per capita basis?

Why do Canadians rank so highly in life insurance ownership?

Why are per capita figures more informative than total figures?

By 1972, what type of life insurance was most popular in Canada? Was this the case prior to 1972?

What was the percentage increase in life insurance sales between 1960 and 1972?

What percentage of life insurance companies are Canadian-incorporated? What do life insurance companies do with the excess premiums they retain after making benefit and dividend payments?

EXERCISES Find the net cost or net gain for these ordinary life policies.

POLICY AMOUNT	AGE AT ISSUE	YEARS IN EFFECT	POLICY AMOUNT	AGE AT ISSUE	YEARS IN EFFECT
1. \$2000	18	15 Cost \$73.00	2. \$5000	20	20 Cost \$53.00
3. \$4000	23	20 Cost \$44.80	4. \$3000	27	15 Cost \$113.25
5. \$6000	29	20 Cost \$112.80	6. \$9000	30	20 Cost \$183.60
7. \$8000	29	15 Cost \$324.80	8. \$10 000	25	20 Cost \$128.00
9. \$11 000	24	To age 65 Gain \$689.48	10. \$14 000	26	20 Cost \$193.20
11. \$15 000	28	To age 65 Gain \$401.85	12. \$10 500	22	20 Cost \$109.20
13. \$10 500	22	To age 65 Gain \$840.42	14. \$10 750	23	20 Cost \$120.35
15. \$10 750	23	To age 65 Gain \$767.44	16. \$9875	25	To age 65 Gain \$527.43

21 f / MORTALITY TABLES

Emphasize that mortality tables record deaths of people in poor health as well as good health. However, life insurance companies screen their risks with physical examinations. Thus their experience is much better than that shown by the tables.

A new table is adopted every 15 to 20 years. The next tables will most likely show a decrease in deaths per 1000 because longevity is increasing.

Mention that since fractions of people cannot die, the number of claims is rounded up the next highest whole number.

Premium rates for life insurance are computed by an *actuary*. The actuary uses a *mortality table* that shows the number of people alive at each age from 1 to 99 years, the number of people that die at each age, and the death rate per 1000 for each age. Table 21.3 shows the mortality table currently in use.

Suppose a group of people, all the same age, take out life insurance policies during the same year. The actuary uses the mortality table to find out how many claims to expect in each of the following years. For example, if 1000 people, age 21, take out life insurance policies in the same year, the insurance company can expect 1.83 claims during the next year. The actuary must set the premium rates to cover both future claims and business expenses.

If we know the number of policyholders, we can use table 21.3 to find the number of claims for any number of years.

$$\text{Number of claims} = \frac{\text{Number of deaths per 1000} \times \text{Number of policyholders}}{1000}$$

EXAMPLE

Suppose 3500 people, age 20, take out life insurance policies in the same year. How many claims will be filed during the next 5 years?

Find the number of deaths per 1000 from age 20 to age 25.

$$1.79 + 1.83 + 1.86 + 1.89 + 1.91 = 9.28$$

Multiply the number of deaths per 1000 by the number of policyholders.

$$9.28 \times 3500 = 32\,480$$

Divide by 1000.

$$32\,480 \div 1000 = 32.48$$

■ During the 5 years, approximately 33 claims will be filed.

EXERCISES Find the number of claims filed.

	NUMBER OF POLICYHOLDERS	AGE AT ISSUE	NUMBER OF YEARS			NUMBER OF POLICYHOLDERS	AGE AT ISSUE	NUMBER OF YEARS	
1.	1000	18	2	4	2.	2000	22	6	24
3.	3000	19	10	57	4.	2600	24	8	43
5.	4200	30	7	70	6.	3900	21	5	37
7.	1500	18	5	14	8.	1800	28	10	43
9.	2200	26	6	28	10.	2450	32	3	18
11.	3275	17	5	29	12.	1780	25	5	18

Commissioners 1958 Standard Ordinary Mortality Table

Age	Number Living	Deaths Each Year	Deaths Per1 000	Age	Number Living	Deaths Each Year	Deaths Per1 000
0	10 000 000	70 800	7.08	50	8 762 306	72 902	8.32
1	9 929 200	17 475	1.76	51	8 689 404	79 160	9.11
2	9 911 725	15 066	1.52	52	8 610 244	85 758	9.96
3	9 896 659	14 449	1.46	53	8 524 486	92 832	10.89
4	9 882 210	13 835	1.40	54	8 431 654	100 337	11.90
5	9 868 375	13 322	1.35	55	8 331 317	108 307	13.00
6	9 855 053	12 812	1.30	56	8 223 010	116 849	14.21
7	9 842 241	12 401	1.26	57	8 106 161	125 970	15.54
8	9 829 840	12 091	1.23	58	7 980 191	135 663	17.00
9	9 817 749	11 879	1.21	59	7 844 528	145 830	18.59
10	9 805 870	11 865	1.21	60	7 698 698	156 592	20.34
11	9 794 005	12 047	1.23	61	7 542 106	167 736	22.24
12	9 781 958	12 325	1.26	62	7 374 370	179 271	24.31
13	9 769 633	12 896	1.32	63	7 195 099	191 174	26.57
14	9 756 737	13 562	1.39	64	7 003 925	203 394	29.04
15	9 743 175	14 225	1.46	65	6 800 531	215 917	31.75
16	9 728 950	14 983	1.54	66	6 584 614	228 749	34.74
17	9 713 967	15 737	1.62	67	6 355 865	241 777	38.04
18	9 698 230	16 390	1.69	68	6 114 088	254 832	41.68
19	9 681 840	16 846	1.74	69	5 859 253	267 241	45.61
20	9 664 994	17 300	1.79	70	5 592 012	278 426	49.79
21	9 647 694	17 655	1.83	71	5 313 586	287 731	54.15
22	9 630 039	17 912	1.86	72	5 025 855	294 766	58.65
23	9 612 127	18 167	1.89	73	4 731 089	299 289	63.26
24	9 593 960	18 324	1.91	74	4 431 800	301 894	68.12
25	9 575 636	18 481	1.93	75	4 129 906	303 011	73.37
26	9 557 155	18 732	1.96	76	3 826 895	303 014	79.18
27	9 538 423	18 981	1.99	77	3 523 881	301 997	85.70
28	9 519 442	19 324	2.03	78	3 221 884	299 829	93.06
29	9 500 118	19 760	2.08	79	2 922 055	295 683	101.19
30	9 480 358	20 193	2.13	80	2 626 372	288 848	109.98
31	9 460 165	20 718	2.19	81	2 337 524	278 983	119.35
32	9 439 447	21 239	2.25	82	2 058 541	265 902	129.17
33	9 418 208	21 850	2.32	83	1 792 639	249 858	139.38
34	9 396 358	22 551	2.40	84	1 542 781	231 433	150.01
35	9 373 807	23 528	2.51	85	1 311 348	211 311	161.14
36	9 350 279	24 685	2.64	86	1 100 037	190 108	172.82
37	9 325 594	26 112	2.80	87	909 929	168 455	185.13
38	9 299 482	27 991	3.01	88	741 474	146 997	198.25
39	9 271 491	30 132	3.25	89	594 477	126 303	212.46
40	9 241 359	32 622	3.53	90	468 174	106 809	228.14
41	9 208 737	35 362	3.84	91	361 365	88 813	245.77
42	9 173 375	38 253	4.17	92	272 552	72 480	265.93
43	9 135 122	41 382	4.53	93	200 072	57 881	289.30
44	9 093 740	44 741	4.92	94	142 191	45 026	316.66
45	9 048 999	48 412	5.35	95	97 165	34 128	351.24
46	9 000 587	52 473	5.83	96	63 037	25 250	400.56
47	8 948 114	56 910	6.36	97	37 787	18 456	488.42
48	8 891 208	61 794	6.95	98	19 331	12 916	668.15
49	8 829 410	67 104	7.60	99	6 415	4 415	1 000.00

table 21.3

CHECKLIST

Actuary (p. 290)
Beneficiary (p. 282)
Cash value (p. 286)
Claim (p. 290)
Coverage (p. 285)
Endowment insurance (p. 282)
Financial protection (p. 282)
Loan value (p. 286)
Mortality table (p. 290)
Net cost (p. 288)
Net gain (p. 288)
Nonforfeiture value (p. 286)
Ordinary life (p. 282)
Policy (p. 282)
Premium (p. 282)
Straight life (p. 282)
Term insurance (p. 283)
Whole life (p. 282)

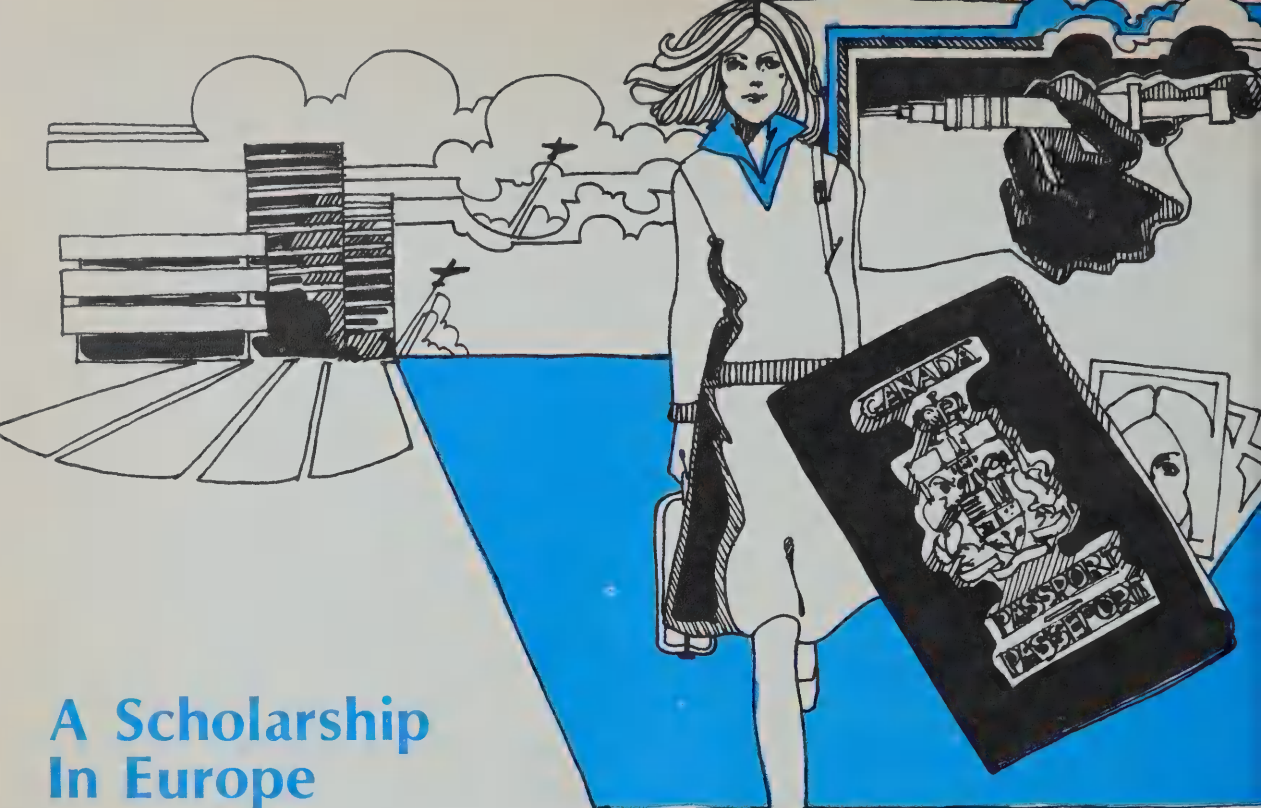
PROBLEMS

1. George is 25 years old. His wife, Anna, is 23. They are expecting their first child. George has no life insurance, but he decides to get some when the baby arrives. After studying his income and expenses, he figures he can afford to invest \$100 per year for life insurance to provide financial protection for Anna and the baby if he should die prematurely. If he survives until the baby grows up, the cash value of the policy can be used to help finance a college education.
 - (a) How much 5 year term insurance can George get for an annual premium of \$100? **\$20 618.56**
 - (b) How much ordinary life can he get? **\$7727.98**
 - (c) How much 20 payment life can he get? **\$4610.42**
 - (d) How much 20 year endowment can he get? **\$3573.98**
 - (e) If George chooses to take the ordinary life policy, what would the cash value be at the end of 20 years? **\$1901.08**
 - (f) If George chooses the ordinary life policy, what would his net cost be at the end of 20 years? **\$98.92**
2. Mary, age 25, is single and lives with her mother, whom she helps support. Her mother is 64 years old and has a small income from her deceased husband's life insurance. Mary decides to take out an insurance policy with her mother as beneficiary, in case her mother should survive her. Mary figures her mother would need the income from a lump sum of \$10 000 to replace the support that she now gives her. Mary can afford to invest up to \$400 annually in life insurance.
 - (a) What would Mary's annual premium be for \$10 000 of 5 year term insurance? **\$48.50**
 - (b) What would her premium be for \$10 000 of ordinary life insurance? **\$129.40**
 - (c) What would her premium be for \$10 000 of 20 payment life? **\$216.90**
 - (d) What would her premium be for \$10 000 of 20 year endowment? **\$279.80**
 - (e) If Mary decides to take the 20 year endowment policy, what will her net cost or net gain be at the end of 20 years when the policy matures for \$10 000 cash? **Gain \$4404.00**
 - (f) If Mary decides to invest the entire \$400 in 20 year endowment insurance, how much life insurance and endowment at maturity will the \$400 annual premium buy? **\$14 295.92**
 - (g) What will Mary's net cost or net gain be at the end of 20 years if she takes the 20 year endowment with the \$400 annual premium? **Gain \$6295.92**
3. Godwin, age 29, and his wife Greta, age 25, have four children. He has enough life insurance on himself to provide the family with an income of \$500 per month for 20 years. After that time, the youngest child will be old enough to be self-supporting. Godwin recognizes that the children would have to be cared for by someone other than himself if his wife died unexpectedly. So he takes out a \$15 000, 5 year term policy on his wife.
 - (a) How much will the annual premium be for the \$15 000 policy? **\$72.75**
 - (b) How much would the premium be if it were paid semi-annually instead of annually? **\$37.10**
 - (c) How much would the premium be if it were paid quarterly instead of annually? **\$18.92**

- (d) How much would the premiums be if it were paid monthly? **\$6.42**
- (e) Since there is no cash value to a term life insurance policy, what will the net cost be after the policy has been in effect for 5 years with premiums paid on a quarterly basis? **\$378.40**
4. Winston is now 65 years old and receiving his Canada Pension Plan benefits. When he was 25 years old, he married and took out a \$50 000 ordinary life policy for the financial protection of his wife and future children. His wife is now dead and the children are all married and self-supporting. Winston decides that he will surrender the policy for its cash value since there is no longer any need for it.
- (a) How much will Winston receive from the insurance company when he surrenders the policy for its cash value? **\$28 550.00**
- (b) What is the net cost or net gain from the policy after it has been in effect for 40 years? **Gain**
- (c) If Winston had surrendered the policy for its cash value at the end of 20 years, when he was 45 years old, how much would he have received from the insurance company?
- (d) What would his net cost or net gain have been after the policy was in effect for 20 years? **Cost**

QUESTIONS

1. What is the purpose of life insurance?
2. What factors determine how much life insurance costs?
3. Which life insurance contract has no investment or savings feature?
4. How does an ordinary life insurance policy differ from a 20 payment life insurance policy?
5. How does a 20 year endowment policy differ from a 20 payment life policy?
6. At any age, which policy has the lowest premium per \$1000 of life insurance—term, ordinary, 20 payment life, or 20 year endowment?
7. What is the extra charge for paying premiums on a quarterly basis rather than an annual basis?
8. What is the cash value of a life insurance policy?
9. How may the policyholder use his life insurance cash values?
10. How do you compute the net cost or net gain for a life insurance policy that has been in effect for 20 years?
11. What are nonforfeiture values?
12. What does an actuary do?
13. How do you find the number of claims filed for a certain number of years?



A Scholarship In Europe

In the morning, a letter arrived telling Myra that she was selected to study in Europe for a year. That afternoon, she was bombarding her friend, Keith, with questions about his recent trip.

"Well, first you'll need a passport," began Keith. "You can get an application at any travel agent or at the post office. You'll also need passport photos taken. It's best to get a few extra photos that you can use for a youth hostel card, a student ID card, and other discount travel cards in various cities.

"You'll also have to go to your doctor and get a yellow vaccination card, plus a smallpox vaccination. This is important since you can't get back into Canada without it. I think you should also have shots for tetanus, typhoid, cholera, and maybe yellow fever, too, if you're going to do much travelling around."

"Wow," exclaimed Myra, as she busily took notes, "it looks like this is going to cost some money even before I get there."

"Yes, there's a \$10 fee for the passport and, of course, the photos and shots cost money, too.

"By the way, how much of your living and travelling expenses does your scholarship cover?" Keith inquired.

"Well," Myra began as she reread her letter, "they pay plane fare to the university. And room and expenses for each term. For the three weeks between terms, I'm on my own and, of course, if I travel on weekends, I must pay my own expenses. I also have to pay the plane fare back."

"That means you'll have to make financial plans for meeting the travelling expenses, plus the living and travelling expenses for the term break. Since you'll be travelling for three weeks, you may want to look into a Eurail pass which you must purchase here. It's good for a month, and you can travel on most European railways for nothing."

"Can't I just take cash?" asked Myra.

"Yes, but it's not a good idea to take a lot," said Keith. "You might take, say \$20 or so in one-dollar bills, for emergency use. Like the time Paul and I arrived in that little German town on Sunday evening, and no banks were open. We used our dollars for a meal and a room. We then cashed some travellers cheques the next day at the bank."

"Tell me about travellers cheques. Are they worthwhile?" asked Myra.

"I think they would be a good idea for your term break, especially if you plan to do any extensive travelling. You can cash them at any bank. Most stores, restaurants, and hotels will take travellers cheques if you don't have any of the country's money."

"Where can I get them?"

"They're issued by American Express Company, Barclays Bank, and other banks, but you can buy them at any bank. If the travellers cheques are lost or stolen, you won't lose any money. The organization that issued them will replace them. By the way, you should carry a record of the cheque numbers separately from the cheques themselves. You have to report the numbers of any missing cheques before you can be reimbursed with new cheques."

"How much do they cost? And how soon do they have to be cashed?"

"They usually cost \$1.00 for each \$100 worth of cheques. And they're good indefinitely once they've been issued."

"What about the time I'm studying and won't be travelling as much?" asked Myra.

"Since you'll be staying at the university for almost a year, you could get a letter of credit from your local bank."

"How does it work?"

Keith explained. "When your bank gives you the letter of credit, it will also give you a list of banks in the principal cities of the world where the letter will be honoured. To get money, you must go to one of the listed banks, which are called correspondent banks. You present the letter, identify yourself by a signature card that will be given to you to carry with you, and

request the amount of money that you need. The amount may not exceed the amount of the letter, less any amount you've already taken out. Each time you use the letter of credit, they deduct the amount you used from it. You also sign a bank draft for the amount you've obtained. This draft is then sent to your local bank for collection. When your home town bank pays the draft, your account is charged with the amount, plus a one percent fee for the service. So, the cost is the same as for travellers cheques."

"Is there any other way of financing the trip?"

"One other way is to use a credit card such as Diners Club or American Express, but these are usually used by businessmen, since only large hotels and restaurants accept credit cards. Students don't have as much use for credit cards."

"Can you tell me anything about exchanging money? You make it sound pretty easy," Myra said.

"It is easy," Keith admitted, "especially since almost all banks, railway stations, airports, and major hotels have exchanging facilities."

"Do they differ much?"

"Yes. The best place to exchange travellers cheques is at a bank. Of course, if you use a letter of credit, you'll have to go to a bank. They usually have the best rate of exchange, since they get daily quotations from the international market. The railway stations and airports have the next best rate of exchange. The hotels and restaurants have the worst rate, since they must go to extra trouble to change the money. Also, each of these places either charges a small fee or varies the exchange rate. For instance, the London Bank charges twenty-five pence for the exchange service. Others charge one half of one percent of the transaction."

"Thanks, Keith. You've been a big help on some of these puzzling details. I must go now. I'll want to ask you more questions later about the neat places to stay and things to see in some of the cities and countries where you stayed."

"I'm sure you'll have a great time, like I did," Keith said as he left for home.

Research/Discuss

- Discuss different ways of budgeting, drawing on students' ideas and experiences. Point out that people often get discouraged because they try to account for every penny that they spend, which is difficult, time consuming, and unnecessary.

CHAPTER 22

BUDGETING

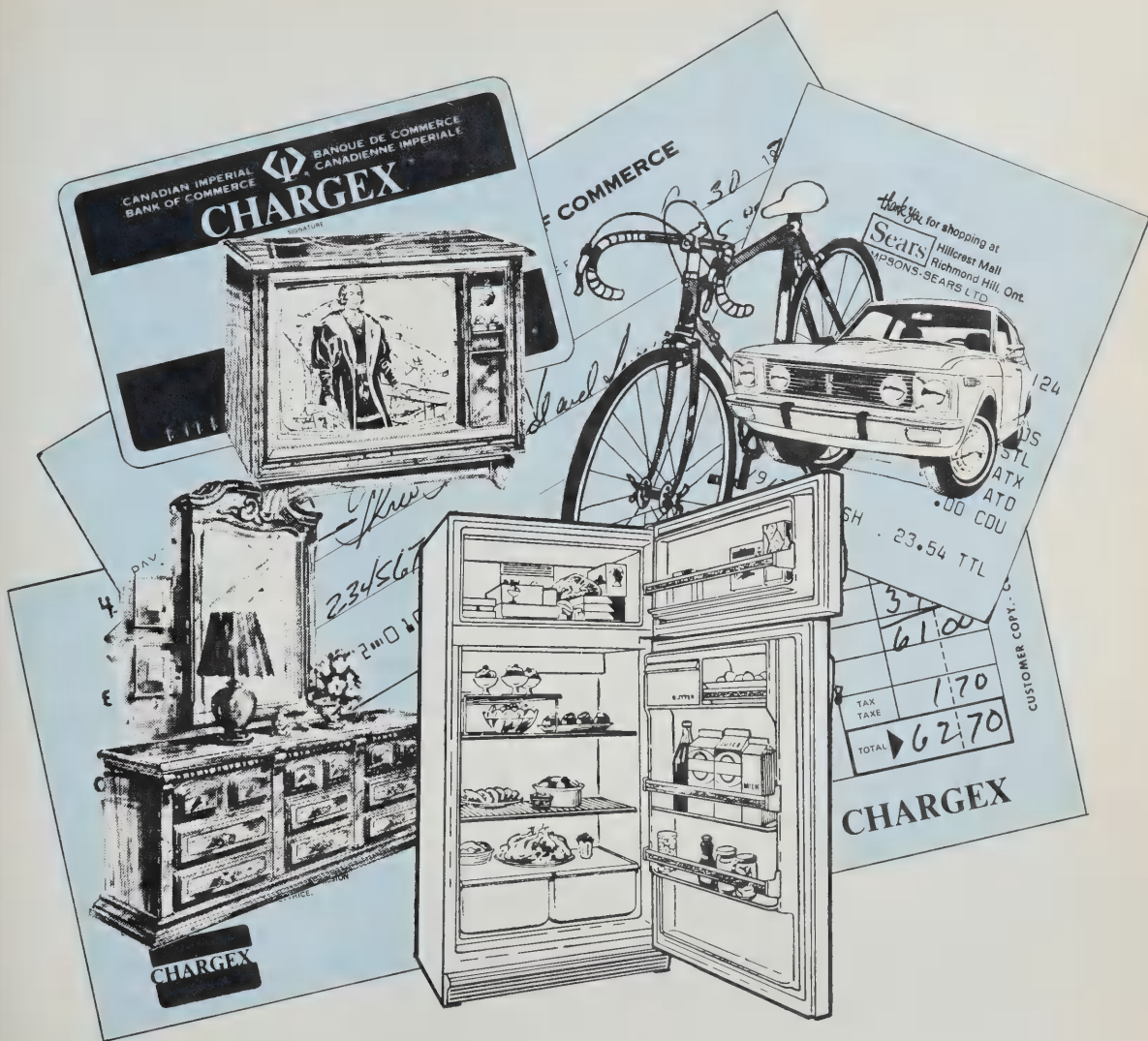
- By not trying to account for every penny spent, and by using bank cheques, credit card slips, cash register tapes, and sales slips to account for most expenses. A good budget system, such as that described in this chapter, can be maintained with as little time as two hours per month.
- So that income and expenses can be controlled and approved, and so that the general public will be able to inspect the records of what has been accomplished, as well as what is planned. Discuss some of the categories of provincial and municipal governmental budgets.
- Discuss these questions: Is a family with a budget more or less likely to get into financial difficulty? Is it able to spend its income to its greatest satisfaction?

RESEARCH/DISCUSS

- Why is it difficult for most people to keep a budget?
- How can budget recordkeeping be simplified?
- Why do provincial and municipal governments operate with a budget?
- What advantages does a family with a budget have over one that doesn't have one?

IN THIS CHAPTER YOU WILL LEARN . . .

- how to budget income and expenses
- how to keep records to make a budget meaningful
- how to balance a budget
- ways to simplify budget recordkeeping



Most high school students have limited incomes, if any. But in a few years, you will be earning wages, buying cars, starting homes of your own. With a good budget plan, you know how your money has been spent. And you can plan and save ahead of time to meet anticipated expenses. If you plan properly, budget records are easy to keep—let others be your bookkeepers by using chequing and charge accounts.

Stress that businesses, schools, and federal, provincial, and municipal governments all have budgets.

The word budget comes from the French word *bougette*, meaning bag or wallet. People used to budget their money by placing amounts in different bags for specific purposes. Some people today still use this method, but there are much better methods available.

What are the advantages of keeping a budget?



- You know how your money has been spent.
- You can save ahead of time for larger expenses.
- You can reduce or eliminate unnecessary and wasteful spending.

Mention that people who budget seldom get into financial difficulty, because successful budgeting keeps a person from spending more than he earns.

Discussion Question: What factors could make a budget unsuccessful?

Consider: Unrealistic spending goals; lack of flexibility in the budget to take care of emergencies; insufficient will power to control impulse buying; and so on.

Point out that this system is often referred to as divided responsibility budgeting. The wife is responsible for the food, household operation, and clothing categories; the husband is responsible for the shelter, transportation, and personal advancement categories.

Amounts budgeted for these categories should allow for emergencies and flexibility.

Many people become discouraged when they start a budget because they cannot keep track of every penny. It is not necessary to be so careful. One way to keep records is to pay for all expenses, except small ones, with cheques or credit cards. The cancelled cheques and credit card statements provide the necessary information for the budget records.

Before you decide how to spend and save, you need to know your disposable income per month. *Disposable income* is the income left over after all the deductions for income tax, Canada Pension Plan, union dues, unemployment insurance, and so on are taken from your paycheque. Next, you must decide how much you are going to spend and how much, if any, you want to save. Actually, when you save money, you intend to spend it or the income from it in the future; otherwise there would be no reason to save it. In theory then, you spend all of your income every month, either for current expenses or for future purchases. These future purchases are usually “big” items such as furniture, televisions, automobiles, vacations, and educational expenses.

In order to save for future spending, you must budget wisely for your current living expenses. This means that necessities such as food, clothing, shelter, transportation, and medical and dental expenses are important in your planning. The following budget system divides all expenses into one of six categories. Here are some examples of what each category contains.

FOOD: Groceries, meat, produce, bakery goods; cost of all meals eaten away from home.

HOUSEHOLD OPERATION: All utility bills, household help, furniture and equipment, appliances, and household supplies.

CLOTHING: All clothing for all members of the family; laundry, dry cleaning, and pressing.

SHELTER: Rent or the portion of the house payment that is *not* applied to the principal, property taxes, and homeowner's insurance.

TRANSPORTATION: Automobile payments, insurance, repairs, license and tax, gasoline, oil, lubrication, and carfare.

PERSONAL ADVANCEMENT: Health, education, recreation, entertainment, vacation, newspapers, magazines, books, contributions, membership fees, and baby sitters.

Anything that is not spent is savings. Note that the portion of a house payment that is applied to the principal of the loan is savings.

Here are some examples of budgets for families of different sizes and with various monthly incomes. Each family must work out its own budget on the basis of size, income, and life style.

Answers to Exercises 1.—5.

- 1. 26.44%, 14.55%, 8.54%, 24.54%, 8.18%, 8.14%, 9.61%
- 2. 25.46%, 15.15%, 10%, 24.55%, 8.77%, 10.01%, 6%
- 3. 24.5%, 14.25%, 7.81%, 21.88%, 8.06%, 8.94%, 14.69%
- 4. 27.22%, 13.72%, 10.25%, 24.06%, 9.31%, 9.69%, 5.75%
- 5. 19.3%, 12.1%, 8.3%, 17.73%, 8.59%, 11.18%, 22.8%

Emphasize that these budgets are based on averages—they are not recommended expenditures.

	A	B	C	D	E
TAKE HOME PAY PER MONTH	\$550	\$650	\$800	\$900	\$1100
NUMBER IN FAMILY	2	4	3	5	2
FOOD	145.40	165.50	196.00	245.00	212.30
HOUSE OPERATION	80.05	98.50	114.00	123.50	133.10
CLOTHING	46.95	65.00	62.50	92.25	91.30
TOTAL	272.40	329.00	372.50	460.75	436.70
SHELTER	135.00	159.50	175.00	216.50	195.00
TRANSPORTATION	45.00	57.00	64.50	83.75	94.50
PERSONAL ADVANCEMENT	44.75	65.50	71.50	87.25	123.00
TOTAL	224.75	282.00	310.00	387.50	412.50
TOTAL SAVINGS	52.85	39.00	117.50	51.75	250.80
TAKE HOME PAY PER MONTH	550.00	650.00	800.00	900.00	1100.00

EXERCISE From the examples of budgets shown above, determine each of the following.

1. What percent of the monthly net income in budget A is budgeted for each of the six categories and what percent is saved?

2. What percent in budget B is budgeted for each category and what percent is saved?

3. What percent in budget C is budgeted for each category and what percent is saved?

4. What percent in budget D is budgeted for each category and what percent is saved?

5. What percent in budget E is budgeted for each category and what percent is saved?

6. Find the average percent budgeted for shelter. 22.55%

7. Find the average percent budgeted for food. 25.58%
8. What is the average percent saved? 11.77%

9. A family of four has a net income of \$785 a month. If they budgeted the income according to these percentages, what is the amount allotted to each budget category?
- | CATEGORY | PERCENTAGE | |
|----------------------|------------|----------|
| Food | 16.5% | \$129.53 |
| Household Operation | 8.5% | \$66.73 |
| Clothing | 5% | \$39.25 |
| Shelter | 28% | \$219.80 |
| Transportation | 17% | \$133.45 |
| Personal Advancement | 15% | \$117.75 |
| Savings | 10% | \$78.50 |

22 b / BUDGETING EXPENSES

Mention again that using a chequing account to pay for miscellaneous purchases and for monthly bills makes the bank your bookkeeper.

Expenses that are the same every month, such as rent or house payments, are already in budget form. Other monthly expenses, such as utility bills for gas, electricity, water, and telephone, vary from month to month. Each of these should be budgeted by finding the average monthly expense.



To find the average monthly expense, divide the annual expense for the previous year by 12.

Life insurance premiums may be paid quarterly, semi-annually, or annually. Paying annually is the most economical way since there is a charge for extra clerical work when payments are made more frequently. Life insurance premiums should be figured on a monthly basis for budgeting.



To find the monthly payment, divide the premium by 3, 6, or 12 for quarterly, semi-annual, or annual premiums.

Homeowner's insurance policies are usually written for three years. The monthly budget figure would be the three-year premium divided by 36.

Property taxes are billed on an annual basis, although they can usually be paid in six installments. Divide the annual tax bill by 12 to find the monthly budget amount.

Project: Estimate your weekly expenses according to your own categories of expenses. Then keep a complete record for a week of all expenditures. How do your actual expenditures compare with your estimates? Did you run out of money before the week was up or did you have some left over?

EXAMPLE

Colin pays his life insurance premium semi-annually. The payments are \$83.22. Find how much should be budgeted each month to pay his insurance expense.

Divide the semi-annual premium by 6.

$$\$83.22 \div 6 = \$13.87$$

- He should budget \$13.87 each month.

EXAMPLE

John has a homeowner's insurance policy written for three years with a premium of \$189. Find the amount for his monthly budget.

Divide the three-year premium by 36.

$$\$189 \div 36 = \$5.25$$

- His monthly budget amount is \$5.25.

FACTS AND FIGURES

Facts and Figures

Household Conveniences in Canada as of May, 1972—

Total Households: 6 108 000

Electricity	99%	Mechanical Refrigerator	99%
Running Water	98%	Powered Lawnmowers	57%
Central Heating	87%	Electric/Gas Ranges	95%
Radios	98%	Cars	78%
Powered Washing Machine	79%	More than 1 Car	18%
Record Players	71%	Television Sets	96%
Telephones	95%		

Examine these figures. What do they tell you about the Canadian standard of living?

EXERCISES Find the amount to be budgeted each month for these expenses.

- Before they set up their budget, Avis and Leonard kept records of the amount spent for food by saving all their cash register slips for three months. In September, the total was \$118, in October, \$130, and in November, \$124. How much should they budget each month for food if they also plan to eat out two nights a month at an average of \$8.00 per night? **\$140.00**
- Vivian estimates that she will spend \$475 on clothes during the year for her family. If dry cleaning and laundry are estimated at \$65 for the year, how much should be budgeted per month for clothing. **\$45.00**
- Hiram has a life insurance policy for which he pays an annual premium. If the premium is \$192, how much should he budget per month to pay it? **\$16.00**
- Jared has a three-year homeowner's policy with a premium of \$168. How much per month should he budget to pay the renewal premium when it becomes due? **\$4.67**
- The Smith family plans to take an extended vacation four years from now. If they need \$2160 to cover all expenses, how much per month must be budgeted. **\$45.00**
- The Jones family had medical and dental expenses of \$364 last year. Using last year as a guide, how much per month should they budget this year for medical and dental expenses? **\$30.33**
- The monthly payment on Roscoe's automobile is \$65.39. Repair and operating expenses are estimated at 4¢ per kilometre and he drives an average of 12 000 kilometres per year. How much per month should he budget for automobile expenses? **\$105.39**
- Beryl estimates that the annual expenses of operating the house will be \$655. How much per month should she budget? **\$54.58**
- Una wants to budget for a piano that costs \$745. How much per month should she budget to buy the piano in 2½ years? **\$24.83**
- Dolph and Rene have a disposable monthly income of \$657.90. Their total budget expenses per month are \$567.90. How much per month can they save? **\$90.00**
- Emil and Annette have a net monthly income of \$743.50. Their monthly budget is as follows:

Food	\$134.45	18.08%
Household Operation	\$73.75	9.9%
Clothing	\$79.75	10.7%
Shelter	\$159.50	21.5%
Transportation	\$65.00	8.7%
Personal Advancement	\$143.55	19.3%
		11.77% (Savings)

How much per month can they save? **\$85.70**
- In problem 11, find the percent that each category, including savings, represents of the monthly income. (See above.)

After you have decided on an acceptable spending and saving plan, you have to keep records so that the budget figures can be matched with the actual expenditures. At the end of the month, you may find that you spent some money that you haven't accounted for. Simply deduct this amount from the savings for that month.

Figure 22.1 shows the start of a system for keeping budget records. At first glance, this system seems complicated, but after a few explanations you will be surprised how simple it is to keep the records.

Column 1 shows the monthly budget of the disposable monthly income. The grand total of this column is the net monthly income after payroll deductions.

Column 2 shows the actual monthly expenditures. The source for these entries is cancelled cheques, credit card sales drafts, sales slips, and cash register slips.

Column 3 shows the net gain or loss in each account. If an entry in column 2 is larger than the amount in column 1, the difference is *net loss*. It should be entered in red or circled. If an entry in column 2 is smaller than the amount in column 1, the difference is *net gain*. A net gain is held in reserve for future spending. If there are no actual expenses in an account, the entire amount is carried forward to column 3 as a budget gain for future use.

Column 4 shows the balances in each account at the close of the previous month. Since this is the first month, there are no amounts shown.

Column 5 is used to transfer account balances between different accounts. For example, one account might accumulate a large balance because few expenditures are made from it. Another account might be nearly exhausted or even overdrawn because of unexpected bills. Budget funds could then be transferred from one account to the other. The two entries offset each other, and the grand total for the column would be zero.

Column 6 shows the balance in each account at the close of the month. These figures are carried forward to column 4 of the next month's record.

Point out that column 5 provides for flexibility in the budget.



When the balance in the chequing account is large enough to avoid bank service charges, transfer the excess to a savings account to earn interest on it.

When there is a savings account, then the balance in column 6 is the sum of the cash on hand and the balances in the chequing and savings accounts.

Budget could begin any month.		This column is filled out before any money is spent.		This column is filled out at the end of the month.		Column 3 is Column 1 minus Column 2.		Since this is the first month, there are no prior balances except savings.	
Budget Controlmaster		Month: January Year: 1976		1	2	3	4	5	6
	Account	Approved Monthly Budget	Actual Monthly Expenses	Budget Gain <u>Loss</u>	Prior Monthly Balances	Budget Transfers	Current Monthly Balances		
I	FOOD	154 00	148 00	6 00					6 00
II	HOUSEHOLD OPERATIONS								
	A. Furniture & Equipment	30 00		30 00					30 00
	B. Heat & Light	20 00	18 20	1 80					1 80
	C. Water	6 00	5 50	50	Net gain.			Column 6 is Column 4 of next month's record.	50
	D. Cable TV	4 00	4 00						
	E. Telephone	5 00	4 00	1 00					1 00
	Sub-totals	65 00	31 70	33 30					33 30
III	CLOTHING	40 00	18 25	21 75					21 75
IV	SHELTER								
	A. Rent or Payment	170 00	170 00						
	B. Homeowner's Insurance	4 00		4 00	No expense so amount is carried over.				4 00
	C. Repairs & Maintenance	15 00		15 00					15 00
	D. Taxes	40 00		40 00					40 00
	Sub-totals	209 00	150 00	59 00					59 00
V	TRANSPORTATION								
	A. Auto Payments	68 50	68 50						
	B. Auto Insurance	15 00		15 00					15 00
	C. Repairs & Lubrication	25 00	3 00	22 00					22 00
	D. Gasoline & Oil	20 00	21 10	1 10	Net Loss.				1 10
	E. Bus & Carfares								
	Sub-totals	128 50	92 60	35 90					35 90
VI	PERSONAL ADVANCEMENT								
	A. Health	25 00	20 00	5 00					5 00
	B. Health Insurance	20 00		20 00					20 00
	C. Education	10 00		10 00					10 00
	D. Recreation & Entertainment	15 00	6 25	8 75					8 75
	E. Publications	7 50	2 00	5 50					5 50
	F. Contributions	7 00	5 00	2 00					2 00
	G. Vacations	25 00		25 00					25 00
	Sub-totals	109 50	33 25	76 25					76 25
VII	SAVINGS	25 00		25 00		250 00			275 00
	GRAND TOTALS	751 00	493 80	257 20		250 00			507 20

This total is the net monthly income.

This total is the actual monthly expenses.

The grand total for this column is always zero.

Cash on hand and in the bank at the end of the month.

figure 22.1

Project: Find a copy of the budget for the federal government or for your provincial or municipal government. Find the percent for each category of expenditure. How do you think government budgets are prepared? Do governments ever spend more than their incomes? How do governments handle a budget deficit?

To summarize, the steps each month in keeping the Budget Controlmaster records are as follows.

- (1) Enter the approved budget in column 1.
- (2) Record the actual monthly expenses from cancelled cheques and other records in the appropriate accounts in column 2.
- (3) Match the budget for each account against the actual expenses and record the difference, if any, in column 3.
- (4) For each account, add the gain (or subtract the loss) for the month to the amount shown in column 4 from the previous month. Record the new balance for the account in column 6. If there is a transfer affecting the account, include it before carrying the balance to column 6.
- (5) Enter the grand total for each column on the grand total line.
- (6) If there are no arithmetic errors, the grand total for column 6 will be the same added both vertically and horizontally.

Figure 22.2 shows the Budget Controlmaster sheet for February. Note that column 4 is identical with column 6 for the previous month. Also, note that \$20.00 is transferred from Savings to Food in column 5. The grand total is the sum of the cash on hand and in the bank at the end of February.

Facts and Figures

Were there more people going to the movies in 1968 or 1950? How does the increase in receipts correspond to the increase in prices?

The amount spent on personal consumption expenditures in 1968 was how many times the amount spent in 1940? Why does this trend follow the same pattern in Canada?

FACTS AND FIGURES

In 1950, there were 19 000 motion picture theaters in the U.S. having total receipts of \$1 320 000 000; the average admission price was 44¢. In 1968, there were 19 000 motion picture theaters in the U.S., having total receipts of \$2 020 000 000; the average admission price was \$1.30.

In 1940, the total personal consumption expenditures for recreation in the U.S. were \$3 761 000 00; the largest amount was spent on admissions to motion picture theaters.

In 1968, it was \$33 552 000 000; the largest amount was spent on radios and television, records, and musical instruments.

EXERCISES Use figures 22.1 and 22.2 to answer the following.

1. What percent of the monthly income is budgeted for personal advancement? **14.6%**
2. What percent of the monthly income is actually spent for personal advancement in January? **4.4%**
3. What percent of the monthly income is actually spent for personal advancement in February? **6.1%**
4. If the homeowner's insurance premium is paid annually in December, how much will be in the account at that time? **\$48.00**
5. How much more was spent on household operations in February than in January? **\$17.10**
6. How much more were the actual monthly expenses in February than in January? **\$42.50**

This column remains the same each month unless the budget is changed.

Identical to column 6 for January.

A circled entry indicates a loss.

Budget Controlmaster

Month: February Year: 1976

		1	2	3	4	5	6
	Account	Approved Monthly Budget	Actual Monthly Expenses	Budget Gain (Loss)	Prior Monthly Balances	Budget Transfers	Current Monthly Balances
I	FOOD	154 00	156 50	(2 50)	6 00	20 00	23 50
II	HOUSEHOLD OPERATIONS						
	A. Furniture & Equipment	30 00	10 80	19 20	30 00		49 20
	B. Heat & Light	20 00	21 00	(1 00)	1 80		80
	C. Water	6 00	6 00		50		50
	D. Cable TV	4 00	4 00				
	E. Telephone	5 00	7 00	(2 00)	1 00		(1 00)
	Sub-totals	65 00	48 80	16 20	33 30		49 50
III	CLOTHING	40 00	6 60	33 40	21 75		55 15
IV	SHELTER						
	A. Rent or Payment	170 00	170 00				
	B. Homeowner's Insurance	4 00		4 00	4 00		8 00
	C. Repairs & Maintenance	15 00		15 00	15 00		30 00
	D. Taxes	40 00		40 00	40 00		80 00
	Sub-totals	209 00	150 00	59 00	59 00		118 00
V	TRANSPORTATION						
	A. Auto Payments	68 50	68 50				
	B. Auto Insurance	15 00		15 00	15 00		30 00
	C. Repairs & Lubrication	25 00	12 90	12 10	22 00		34 10
	D. Gasoline & Oil	20 00	17 50	2 50	(1 10)		1 40
	E. Bus & Carfares						
	Sub-totals	128 50	98 90	29 60	35 90		65 50
VI	PERSONAL ADVANCEMENT						
	A. Health	25 00	29 50	(4 50)	5 00		50
	B. Health Insurance	20 00		20 00	20 00		40 00
	C. Education	10 00		10 00	10 00		20 00
	D. Recreation & Entertainment	15 00	9 00	6 00	8 75		14 75
	E. Publications	7 50	2 00	5 50	5 50		11 00
	F. Contributions	7 00	5 00	2 00	2 00		4 00
	G. Vacations	25 00		25 00	25 00		50 00
	Sub-totals	109 50	45 50	64 00	76 25		140 25
VII	SAVINGS	25 00	10 00	15 00	275 00	(20 00)	320 00
	GRAND TOTALS	751 00	536 30	214 70	507 20		721 90

\$10.00 has been spent and not accounted for. So it is deducted from Savings.

The grand total for column 5 is zero.

Transferred from Savings to Food.

Cash on hand and in the bank at the end of February.

figure 22.2

REVIEW / BUDGETING

CHECKLIST

Account (p. 303)
 Actual monthly expenses (p. 303)
 Approved monthly budget (p. 303)
 Average monthly expense (p. 300)
 Budget (p. 298)
 Budget Controlmaster sheet (p. 303)
 Budget Controlmaster system (p. 302)
 Current monthly balances (p. 303)
 Disposable income (p. 298)
 Expenses (p. 298)
 Net gain (p. 302)
 Net loss (p. 302)
 Net monthly income (p. 302)
 Prior monthly balances (p. 303)
 Savings (p. 299)

PROBLEMS

1. Prepare the budget record sheet for the month of March, carrying forward the closing balances for February (column 6 of figure 22.2). Use accountants' working paper with at least six columns and an account description column at the left. The actual expenses for March are: *Answer is in back of book.*

I	FOOD	\$159.00
II	HOUSEHOLD OPERATIONS	
	A. Furniture & Equipment	\$10.50
	B. Heat & Light	\$21.00
	C. Water	\$6.00
	D. Cable TV	\$4.00
	E. Telephone	\$4.50
III	CLOTHING	\$23.60
IV	SHELTER	
	A. Rent or Payment	\$170.00
	B. Homeowner's Insurance	none
	C. Repairs & Maintenance	\$12.40
	D. Taxes	none
V	TRANSPORTATION	
	A. Auto Payments	\$68.50
	B. Auto Insurance	none
	C. Repairs & Lubrication	\$14.30
	D. Gasoline & Oil	\$21.50

VI PERSONAL ADVANCEMENT

A.	Health	\$35.00
B.	Health Insurance	none
C.	Education	none
D.	Recreation & Entertainment	\$10.80
E.	Publications	\$8.75
F.	Contributions	\$5.00
G.	Vacations	none
GRAND TOTAL		\$574.85

2. Prepare the budget record sheet for April, carrying forward the closing balances for March in problem 1. The actual expenses for April are: *Answer is in back of book.*

I	FOOD	\$163.50
II	HOUSEHOLD OPERATIONS	
	A. Furniture & Equipment	none
	B. Heat & Light	\$18.80
	C. Water	\$6.50
	D. Cable TV	\$4.00
	E. Telephone	\$6.00
III	CLOTHING	\$22.75
IV	SHELTER	
	A. Rent or Payment	\$170.00
	B. Homeowner's Insurance	none
	C. Repairs & Maintenance	none
	D. Taxes	none
V	TRANSPORTATION	
	A. Auto Payments	\$68.50
	B. Auto Insurance	\$45.00
	C. Repairs & Lubrication	\$3.00
	D. Gasoline & Oil	\$24.35
VI	PERSONAL ADVANCEMENT	
	A. Health	none
	B. Health Insurance	\$60.00
	C. Education	\$15.00
	D. Recreation & Entertainment	\$9.60
	E. Publications	\$3.65
	F. Contributions	\$5.00
	G. Vacations	none
GRAND TOTAL		\$625.65

3. Determine the percentage that each item in the monthly approved budget is of the total income for the month.
4. Find the average monthly expenditures for January, February, March, and April for these budget items: Food, Heat & Light, Clothing, Gasoline & Oil, Recreation & Entertainment, and Publications.
\$156.75 \$19.75; \$17.80; \$21.11; \$8.91; \$4.10
5. Assume that you have a monthly income or allowance of \$50.00 to be used for your clothing, lunches, transportation, and personal expenses. Prepare an approved monthly budget for the \$50.00. You may omit or add to the budget items suggested.
6. If you have a monthly income or allowance, prepare a monthly budget for it. If you don't have a monthly income or allowance, prepare a monthly budget for the income that you would like to have.

QUESTIONS

1. Why does your school district operate with a budget?
2. What are the advantages of keeping a budget?
3. What are the disadvantages of keeping a budget?
4. What are some reasons why many people get discouraged with budgeting?
5. How do you start a budget?
6. How do you determine the monthly amount to budget for expenses that don't occur every month?
7. How can you keep records of where your money is spent?
8. What is disposable or net income?
9. How do you know if there are any arithmetic errors in the Budget Controlmaster sheet?
10. How do you verify the grand total in column 6?
11. How are budget account transfers made?
12. How are negative accounts shown?

Answer to Problem 3.

3. Food: 20.5%; Furniture and Equipment: 4%; Heat and Light: 2.7%; Water: .8%; Cable TV : 0.5%; Telephone: 0.7%; Clothing: 5.3%; Rent or Payment: 20%; Homeowner's Insurance: 0.5%; Repairs and Maintenance: 2%; Taxes: 5.3%; Auto payments: 9.1%; Auto Insurance: 2%; Repairs and Lubrication: 3.3%; Gas and Oil: 2.7%; Health: 3.3%; Health Insurance: 2.7%; Education: 1.3%; Recreation and Entertainment: 2%; Publications: 1%; Contributions: 0.9%; Vacations: 3.3%; Savings: 3%.

Research/Discuss

- Elicit these answers: Two or more persons bring additional knowledge and skills to the business, more capital is available, and the risk is shared.
- These two questions are designed to get students to understand small business on a more personal level. Your discussion should bring out the following ideas: Many things are

CHAPTER 23

needed for a partnership, including working capital, mechanical aptitude and skill, a place to do business, a partnership agreement, and the necessary business licenses. Satisfaction on the part of both partners is also a necessary ingredient—the partner with more to invest should have extra compensation.

- The biggest disadvantage of a general partnership is the unlimited liability of each partner for the debts of the partnership. Personal assets may be attached to pay partnership debts. Another is that the partners may not make the necessary sacrifices of time and hard work as they would if each were working for himself. Furthermore, if one of the partners resigns, dies, or becomes insane, the partnership is automatically dissolved by law.

PARTNERSHIPS

RESEARCH/DISCUSS

- Why do some people prefer a partnership to their own single enterprise?
- If you and a friend decided to form a partnership to repair automobiles, what would you need to get started?
- If you had more skill, money, and tools to invest in the repair business, how would you and your partner make allowances for the situation?
- What are some of the hazards of entering a partnership?

IN THIS CHAPTER YOU WILL LEARN . . .

- some of the advantages and disadvantages of going into business with other persons
- what kind of agreements are made among partners concerning salaries, profits, losses, and interest on investments
- how the ratio of each partner's investment may determine his share of the profits
- what makes a good partnership agreement

While some people prefer to own and manage a business by themselves, others would rather share the risk and responsibility with one or more partners. There are advantages and disadvantages to a partnership.

- People with different abilities and interests can be brought together to strengthen a business.
- Two or more people can usually provide more money than one person to start a business.
- Each partner is responsible for all debts of the partnership.
- A partnership business is automatically dissolved by law if any partner dies, resigns, becomes bankrupt, or becomes insane.



When two or more people form a partnership, an agreement, called the Articles of Partnership, should be made in writing. This agreement shows the duties and responsibilities of each partner. It also

Stress the importance of having a lawyer prepare the partnership agreement.

These Articles of Copartnership entered into the fifteenth
day of March one thousand nine hundred and seventy - six
Between Joseph R Willets
Carl H. Lambert

Witnesseth:

That the parties above named have agreed and do agree to become copartners in business together, and to that end and purpose they agree THAT:

First: The firm name of the copartnership shall be

Lambert-Willets Co. Ltd.

Second: The purpose of the copartnership shall be to engage for profit in the business of
pharmaceutical research

Third: The place of business of the copartnership shall be at

700 Hanover Way, Halifax, Nova Scotia

or at such other place or places as the partners may from time to time agree upon.

Fourth: The copartnership shall commence on the first day of

April, 1976, and shall continue

Many stationery stores stock simple legal forms, such as this partnership agreement. The partners can simply fill in data pertinent to their situation. Articles not shown here specify the amount of the beginning capital, how profits and losses are to be divided, and methods and dates for accounting. After signing the document before witnesses, the partners may file it with the county recorder to make it a matter of public record.

Project: Find some businesses in your community that are partnerships. How old are the businesses? Interview the partners to find out their reasons for doing business as partners.

specifies how the profits and losses of the business will be divided. If this agreement isn't made, then by law, the profits and losses must be divided equally.

Sometimes partnership agreements provide for the profits and losses to be divided in proportion to the amount of money originally invested. That is, the partner who invests the most money receives the largest share of the profits. And the partner who invests the most money must also take the largest share of the losses.

EXAMPLE

Jones, Jackson, and Jordan form a partnership for the retail sale of bicycles and motorcycles. They agree to share profits and losses proportionally according to their respective capital investments. The investments were—Jones, \$5000; Jackson, \$2500; and Jordan, \$7500. The net profit at the end of the first year was \$32 850. How much of the net profit should each partner receive?

Find the sum of the capital investments.

$$\$5000 + \$2500 + \$7500 = \$15\ 000$$

Find the ratio of each partner's investment to the total investment.

$$\text{Jones: } \frac{\$5000}{\$15\ 000} = \frac{1}{3}$$

$$\text{Jackson: } \frac{\$2500}{\$15\ 000} = \frac{1}{6}$$

$$\text{Jordan: } \frac{\$7500}{\$15\ 000} = \frac{1}{2}$$

Divide the net profits according to the ratios.

$$\text{Jones: } \frac{1}{3} \times \$32\ 850 = \$10\ 950$$

$$\text{Jackson: } \frac{1}{6} \times \$32\ 850 = \$5475$$

$$\text{Jordan: } \frac{1}{2} \times \$32\ 850 = \$16\ 425$$

■ Jones should receive \$10 850; Jackson, \$5475; and Jordan, \$16 425.

EXAMPLE

Pruitt, Pearson, and Pomeroy invested \$5000, \$7000, and \$8000 respectively in a partnership as roofing contractors. They agreed to share profits and losses in proportion to their capital investments. The first year showed an operating net loss of \$5200. How much of the net loss should each partner take?

Find the sum of the capital investments.

$$\$5000 + \$7000 + \$8000 = \$20\ 000$$

Find the ratio of each partner's investment to the total investment.

$$\text{Pruitt: } \frac{\$5000}{\$20\,000} = 25\%$$

$$\text{Pearson: } \frac{\$7000}{\$20\,000} = 35\%$$

$$\text{Pomeroy: } \frac{\$8000}{\$20\,000} = 40\%$$

Divide the net loss according to the ratios.

$$\text{Pruitt: } 25\% \times \$5200 = \$1300$$

$$\text{Pearson: } 35\% \times \$5200 = \$1820$$

$$\text{Pomeroy: } 40\% \times \$5200 = \$2080$$

- Pruitt should take \$1300 in losses; Pearson, \$1820; and Pomeroy, \$2080.

EXERCISES Divide these net profits and net losses according to the ratio of capital invested.

NET PROFIT OR LOSS	PARTNER	CAPITAL INVESTMENT	NET PROFIT OR LOSS	PARTNER	CAPITAL INVESTMENT
1. \$10 000 profit	O'Reilly	\$1500 \$3750.00	2. \$15 000 profit	Sanchez	\$4500 \$6136.36
3. \$20 000 profit	Murphy	\$2500 \$6250.00		Rodriguez	\$6500 \$8863.64
	Goldberg	\$7000 \$11 666.67	4. \$25 000 profit	Nakamura	\$6000 \$10 000.00
5. \$30 000 profit	Steinberg	\$5000 \$8333.33		Higashi	\$9000 \$15 000.00
	MacDonald	\$7500 \$14 062.50	6. \$3250 loss	Jensen	\$5500 Loss \$1489.58
7. \$4580 loss	MacIntosh	\$8500 \$15 937.50		Olsen	\$6500 Loss \$1760.42
	Johnson	\$7600 Loss \$2148.64	8. \$34 950 profit	Reimer	\$10 000 \$15 886.36
9. \$2850 loss	Ryerson	\$8600 Loss \$2431.36		Huber	\$12 000 \$19 063.64
	Vlovov	\$5250 Loss \$1273.40	10. \$4470 loss	Ferrante	\$7800 Loss \$2905.40
11. \$15 470 profit	Romanoff	\$6500 Loss \$1576.60		Cardinale	\$4200 Loss \$1564.50
	Figueroa	\$5300 \$6832.58	12. \$35 420 profit	Lee	\$6000 \$10 120.00
	Ochoa	\$6700 \$8637.42		Fong	\$7000 \$11 806.67
13. \$39 760 profit				Wong	\$8000 \$13 493.33
	Corbat	\$10 000 \$11 044.44	14. \$5300 loss	Brown	\$9000 Loss \$1445.45
	Renet	\$12 000 \$13 253.33		White	\$11 000 Loss \$1766.67
	Chevalier	\$14 000 \$15 462.22		Blue	\$13 000 Loss \$2087.88
15. \$41 166 profit	Taylor	\$10 000 \$11 761.71	16. \$50 369 profit	Shoemaker	\$15 000 \$12 592.25
	Baker	\$11 000 \$12 937.89		Farmer	\$20 000 \$16 789.67
	Painter	\$14 000 \$16 466.40		Butcher	\$25 000 \$20 987.08

In Canada, the partnership agreement provides that each partner will receive interest on his invested capital before the profits are divided. This is a fair agreement. The partner who invests the most should be compensated the most. He is risking his capital and is also not receiving interest from a savings account or securities.

EXAMPLE

Able, Baker, and Carlson form the ABC Company. The partnership agreement provides that net profits and losses will be shared equally by the partners after 6% interest is paid on invested capital. Able invested \$5000; Baker, \$8000; and Carlson, \$12 000. Net profits for the year are \$48 572. Divide the net profits according to the agreement.

Find the interest on invested capital for each partner.

$$\text{Able: } 6\% \times \$5000 = \$300$$

$$\text{Baker: } 6\% \times \$8000 = \$480$$

$$\text{Carlson: } 6\% \times \$12\,000 = \$720$$

Deduct the total interest from the net profit.

$$\$300 + \$480 + \$720 = \$1500$$

$$\$48\,572 - \$1500 = \$47\,072$$

Divide the net profits after interest equally among the partners.

$$\$47\,072 \div 3 = \$15\,690.66$$

Add the net profit to the interest for each partner.

$$\text{Able: } \$15\,690.66 + \$300.00 = \$15\,990.66$$

$$\text{Baker: } \$15\,690.66 + \$480.00 = \$16\,170.66$$

$$\text{Carlson: } \$15\,690.66 + \$720.00 = \$16\,410.66$$

■ Able should receive \$15 990.66; Baker, \$16 170.66; and Carlson, \$16 410.66.

EXAMPLE

Borden, Smith, and Bilaniuk are partners with an agreement to share profits and losses equally after 8% interest on capital investments. They invested \$4000, \$5000, and \$6000 respectively. At the end of the year, the partnership had a net loss of \$2689. How much loss of capital should each partner take?

Divide the net loss equally among the partners.

$$\$2689 \div 3 = \$896.33$$

Find the amount of interest for each partner.

$$\text{Borden: } 8\% \times \$4000 = \$320$$

$$\text{Smith: } 8\% \times \$5000 = \$400$$

$$\text{Bilaniuk: } 8\% \times \$6000 = \$480$$

Discussion Question: What is a "silent partner?"

Consider: Reasons for becoming a silent partner—an investment with no responsibilities; circumventing a law; role in the partnership.

Divide the total interest among the three partners as an additional loss.

$$\$320 + \$400 + \$480 = \$1200$$

$$\$1200 \div 3 = \$400$$

Find the net gain or loss of interest for each partner. (Each loses \$400 interest.)

Borden: Gained \$320, lost \$400—\$80 net loss

Smith: Gained \$400, lost \$400—no gain or loss

Bilaniuk: Gained \$480, lost \$400—\$80 net gain

Combine the net gain or loss from interest with the net loss from operations.

	INTEREST	OPERATIONS	TOTAL LOSS
Borden	\$80 loss	\$896.33 loss	\$976.33
Smith	none	\$896.33 loss	\$896.33
Bilaniuk	\$80 gain	\$896.33 loss	\$816.33

- Borden should take \$976.33 losses; Smith, \$896.33; and Bilaniuk, \$816.33.

Project: With one or two members of your class, pick a business you would like to start. How much capital would you need? What kind of equipment would you have to buy initially? How long could you operate at a loss before becoming bankrupt?

EXERCISES Divide these profits or losses equally among the partners. Include interest on capital investments.

NET PROFIT OR LOSS	PARTNER	CAPITAL INVESTMENT	INTEREST RATE
1. \$8344 profit	Davis	\$4172.00	8%
	Spencer	\$4172.00	
2. \$15 369 profit	Knight	\$7597.00	7%
	Spindler	\$7772.00	
3. \$25 234 profit	Lyons	\$12 717.00	10%
	Griffin	\$12 517.00	
4. \$1879 loss	Reid	Loss \$903.50	9%
	Wright	Loss \$975.50	
5. \$14 638 loss	King	Loss \$7239.00	8%
	Finch	Loss \$7399.00	
6. \$33 193 profit	Jolley	\$16 716.50	8%
	Shannon	\$16476.50	
7. \$38 980 profit	Davenport	\$19 580.00	6%
	Clark	\$19 400.00	
8. \$45 400 profit	Patrick	\$22 670.00	6%
	Jackson	\$22 730.00	
9. \$27 842 profit	Stone	\$9200.66	8%
	Hughes	\$9280.66	
	Briles	\$9360.66	
10. \$4800 loss	McKay	Loss \$1503.33	10%
	Page	Loss \$1663.33	
	Ryan	Loss \$1633.33	

23 C / DIVIDING NET PROFITS

Mention that for a partnership to be successful, all the partners must be satisfied with the partnership agreement.

Point out that interest and salaries are treated as operating expenses of a partnership.

A good partnership agreement will usually include three things:

- (1) The division of profits and losses
- (2) Interest on invested capital
- (3) Salaries for the partners

The salaries are usually based on the amount of time that a partner devotes to the business and his experience and special skills. For instance, a partner who devotes all his time to the business should receive more salary than a partner who devotes only a part of his time. Also, a partner with a great deal of experience and skill is entitled to more compensation than an inexperienced partner.

EXAMPLE

Wilson, Tyler, and Kelly form a partnership and agree that: (1) Wilson will receive a \$600 salary per month; Tyler and Kelly will each receive a \$300 salary per month. (2) Interest will be paid on invested capital at a rate of 8%. (3) Profits and losses will be shared equally. Wilson invests \$15 000; Tyler, \$16 000; and Kelly, \$9000. The net profit before salaries and interest is \$36 776 for the year. Divide the profits according to the partnership agreement.

Find the amount of salary to be deducted.

Wilson:	$12 \times \$600 = \7200
Tyler:	$12 \times \$300 = \3600
Kelly:	$12 \times \$300 = \3600
Total:	<u>\$14 400</u>

Find the amount of interest to be deducted.

Wilson:	$8\% \times \$15\ 000 = \1200
Tyler:	$8\% \times \$16\ 000 = \1280
Kelly:	$8\% \times \$9000 = \$\ 720$
Total:	<u>\$3200</u>

Deduct salary and interest from the balance of the profits.

$$\$14\ 400 + \$3200 = \$17\ 600$$

$$\$36\ 776 - \$17\ 600 = \$19\ 176$$

Divide the balance of the profits equally.

$$\$19\ 176 \div 3 = \$6392$$

Find each partner's share of the net profit.

Call attention to the cross-balance feature, which insures accuracy.

	Salary	Interest	Net Profit	Share of Profit
Wilson	\$7200	\$1200	\$6392	\$14 792
Tyler	\$3600	\$1280	\$6392	\$11 272
Kelly	\$3600	\$\ 720	\$6492	\$10 712
Totals	\$14 400	\$3200	\$19 176	\$36 776

EXAMPLE

Skidmore and Hopkins are partners who agree to share profits and losses in the ratio of 60% to 40% respectively. Each month Skidmore will receive a salary of \$500 and Hopkins \$350. Each will receive 10% interest on his invested capital: \$15 000 and \$10 000 respectively. The net profit for the year before provisions for salaries and interest is \$9580. Divide the net profit according to their agreement. *Find the amount of salary to be deducted.*

$$\begin{array}{rcl} \text{Skidmore:} & 12 \times \$500 = & \$6000 \\ \text{Hopkins:} & 12 \times \$350 = & \$4200 \\ \text{Total:} & & \underline{\$10\,200} \end{array}$$

Find the amount of interest to be deducted.

$$\begin{array}{rcl} \text{Skidmore:} & 10\% \times \$15\,000 = & \$1500 \\ \text{Hopkins:} & 10\% \times \$10\,000 = & \$1000 \\ \text{Total:} & & \underline{\$2500} \end{array}$$

Deduct the total salary and interest from the next profit.

$$\begin{array}{l} \$10\,200 + 2500 = \$12\,700 \\ \$9580 \text{ less } \$12\,700 \text{ is } \$3120 \text{ loss} \end{array}$$

Divide the net loss according to the partnership agreement.

$$\begin{array}{rcl} \text{Skidmore:} & 60\% \times \$3120 = & \$1872 \\ \text{Hopkins:} & 40\% \times \$3120 = & \$1248 \end{array}$$

Find each partner's share of the net profit.

	Salary	Interest	Net Profit (Loss)	Share of Profit
Skidmore	\$6000	\$1500	(\$1872)	\$5628
Hopkins	\$4200	\$1000	(\$1248)	\$3952
Totals	\$10 200	\$2500	(\$3120)	\$9580

Project: Write up a partnership agreement with one or two members of your class. Include financial arrangements and responsibilities for each partner.

Emphasize that not all businesses operate profitably.

EXERCISES Determine the distribution of profits or losses for these partnerships. The net profits or losses are before salaries and interest.

1. Addison and Rolland are partners. Addison invested \$6000 and Rolland \$4000. Addison is to receive \$300 per month salary and Rolland \$200. Each partner will receive 8% interest on his capital investment. Profits and losses will be shared equally. The net profit for the year is \$10 650.

Addison: \$6005.00; Rolland: \$4645.00

2. Ryan and Sage each invested \$10 000. Ryan will receive a salary of \$800 per month and Sage \$500 per month. Profits and losses will be divided 55% to Ryan and 45% to Sage. The net profit for the year is \$33 785.

Ryan: \$19 601.75; Sage: \$14 183.25

3. Azevedo and Lewis formed a partnership to

build houses. They invested \$9000 and \$12 000 respectively. Azevedo is to receive \$900 per month salary and Lewis \$600. Each partner is to receive 9% interest on his investment. Profits and losses will be shared equally. The net profit for the year is \$18 888.

Azevedo: \$11 109.00; Lewis: \$7779.00

4. Firestone, Ferguson, and Zilch form a partnership as public accountants. Each invests \$5000. The salaries are \$950, \$850, and \$750 per month respectively. The profits and losses will be divided 40% to Firestone, 30% to Ferguson, and 30% to Zilch. The net profit for the year is \$3300.

Firestone: \$480.00; Ferguson: \$2010.00; Zilch: \$810.00

CHECKLIST

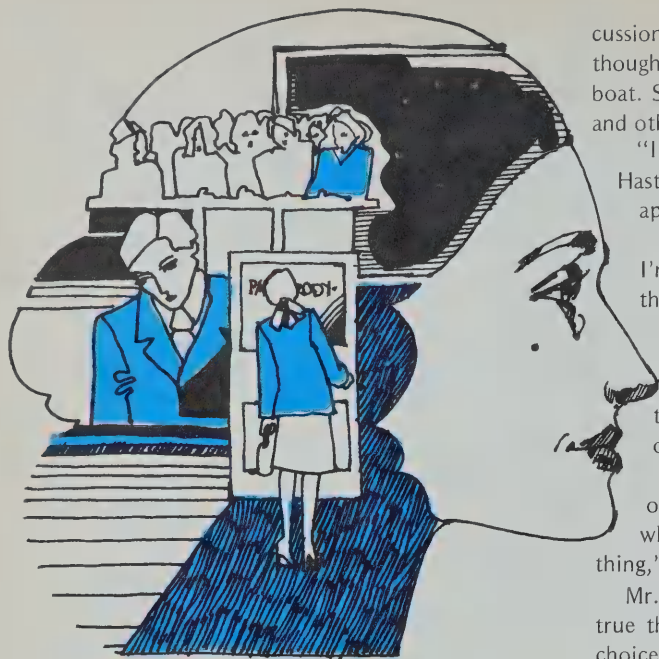
Articles of Partnership (p. 309)
Capital investment (p. 312)
Interest on invested capital (p. 312)
Net gain (p. 313)
Net loss (p. 310)
Net profit (p. 310)
Partnership (p. 309)
Proportion (p. 310)
Salary (p. 314)

PROBLEMS

- Palmer and Miller form P & M Lighting fixtures. The partnership agreement provides that net profits and losses will be shared equally by the partners after 8% interest is paid on invested capital. Palmer invests \$4000 and Miller invests \$7000. Net profits for the year are \$9990. Divide the net profits according to the agreement.
Palmer: \$4875.00; Miller: \$5115.00
- Larson and Hawkins are partners with an agreement to share profits and losses equally after 7% interest on capital investments. Larson invested \$10 000 and Hawkins invested \$13 000. At the end of the year, the partnership had a net profit of \$18 268. How much of the profit should each partner receive?
Larson: \$9029.00; Hawkins: \$9239.00
- Hinwood and Wheeler are partners in a contracting business. They have an agreement to share profits and losses equally after 10% interest on capital investments. They invested \$8200 and \$6800 respectively. The net profits at the end of the year were \$23 875. Divide the net profits according to the agreement.
Hinwood: \$12 007.50; Wheeler: \$11 867.50
- A partnership agreement was drawn up by Saylor and Tipton when they opened their sporting goods store. It provided for the partners to share profits and losses equally after 9% interest on capital investments. The net profits at the end of the year were \$48 237. If Saylor invested \$10 500 and Tipton invested \$15 500, what was each partner's share of the net profits?
Saylor: \$23 893.50; Tipton: \$23 343.50
- Arndt, Carter, and Henderson are partners with an agreement to share profits and losses equally after 10% interest on capital investments. They invested \$4000, \$8000, and \$9000 respectively. Net profits for the year were \$22 975. Divide the net profits according to the agreement.
Arndt: \$7358.33; Carter: \$7758.33; Henderson: \$7858.33
- Stewart, Tolman, and Turner have a partnership agreement that provides for the partners to share profits and losses equally after 9% interest on capital investments. Stewart invested \$8000; Tolman, \$9000; and Turner, \$5000. At the end of the year, the partnership had a net loss of \$13 340. How much of the loss should each partner take?
Stewart: \$4386.66; Tolman: \$4296.66; Turner: \$4656.66
- Brooks and Talcott invested \$7500 and \$12 000 respectively. Each is to receive 10% interest on his investment. The salaries are \$500 and \$650 per month respectively. Profits and losses will be shared equally. The net profit for the year is \$27 345. Determine the distribution of the profits.
Brooks: \$12 547.50; Talcott: \$14 797.50
- Rosenberg and Kidwell each invested \$7500 in a partnership to provide landscaping and garden maintenance services. They agreed on monthly salaries of \$650 and \$500 respectively. Rosenberg will receive 60% and Kidwell 40% of the profits and losses. The net profit for the year is \$25 800. Determine the distribution of the profits.
Rosenberg: \$15 000.00; Kidwell: \$10 800.00
- Mulligan and Carney invest \$12 000 and \$18 000 respectively in a partnership to operate a restaurant. Mulligan will receive a salary of \$950 per month and Carney \$650 per month. Each will receive 10% interest on his investment. Profits and losses will be shared equally. The net profit for the year is \$45 200. Determine the distribution of the profits.
Mulligan: \$24 100.00; Carney: \$21 100.00
- Raymond and Birdwell form a partnership to exterminate pests. Their salaries are \$475 and \$350 per month respectively. Washington invests \$2000 and Birdwell, \$1500. Each is to receive 8% interest on his investment. Profits and losses are to be shared equally. Determine the distribution of the \$5390 profits for the year.
Raymond: \$3465.00; Birdwell: \$1925.00

QUESTIONS

1. How is a partnership formed?
2. What are the legal responsibilities of each partner?
3. What advantages does a partnership have over a single enterprise?
4. What are the disadvantages of a partnership?
5. Under what conditions should one partner receive a higher salary than another partner?
6. In the absence of a written agreement, how are profits and losses shared according to law?
7. How is a partnership terminated?
8. How many partners compose a partnership?



The World's Richest Woman

When Georgia Martin won \$500 in the Business Education Week Poster Contest, she knew she would invest the money in stocks. This had been her dream for a long time. Her classmates were very envious, and most of them indulged in wild dreams about how they would spend such a windfall. In her business and consumer math class—they called it Biz-Con—there was a loud dis-

cussion of what Georgia should do. Some of the boys thought she should make a down payment on a car or boat. Some of the girls mentioned spending it on clothes, and others urged her to put it in the bank.

"I think a class party would be neat!" cried Roger Haston and everyone clapped and shouted their approval.

"No, Roger," said Georgia. "I've already decided. I'm going to buy stocks. One of these days I'll be the world's richest woman. And when I have lots of money, I'll give it all away—to poor people like you, Roger."

Everyone laughed except Roger, who turned away muttering to himself, trying to think of a way to get as lucky as Georgia.

"Ever since we started the stock market unit in our workbooks, keeping the records every day of what we pretend to own, I've wanted to try the real thing," Georgia told the class.

Mr. Willard, their teacher, looked thoughtful. "It's true that Georgia has done well with her stock market choices in class this year. But remember, if things don't go well, you'll be losing real money. It's more than little marks in your Biz-Con project book."

Georgia was insistent. "I'm going to stop at the stockbroker's office on the way home from school—tonight!"

"Then tomorrow," suggested Mr. Willard, "you can tell us all about what goes on there."

"You're on," said Georgia firmly. As Mr. Willard began the lesson, she noticed that Roger Haston was staring blankly out the window.

Georgia didn't feel so sure of herself when she came to the office of Parody & Parody, Brokers. In fact, she couldn't make herself go in and walked right past it. She looked sideways through the window though, and saw some people sitting at desks and some standing, all with their backs to the street.

"Get a hold of yourself," she said to herself. "Remember, you *do* have \$500 to spend!"

She went boldly through the revolving door.

No one paid any attention to her as she stood inside the door. The men at the desks and the people standing around the room were all watching numbers and letters

move along a screen on the back wall. It was like a long narrow TV screen. After she looked at it for a moment, she realized it must be an electronic ticker tape, giving the current prices for all the stock transactions. Finally she went over to a woman sitting near the door.

"May I talk to someone about investing some money?"

The woman nodded and replied, "Certainly. Mr. Foresight is our account executive on call today. I'll ring his phone and tell him you're here.

"Mr. Foresight will see you now. His desk is the first one on the left side at the far end of the room."

Georgia walked along the aisle and noticed a man standing near his desk, waiting for her.

"Mr. Foresight? I'm Georgia Martin, and I have \$500 to invest!" she blurted out. "I want to become the world's richest woman!"

The next afternoon, Georgia was the center of attention as she described her interview.

"After some get-acquainted talk, he asked me what my investment objectives were. I said that I didn't know. So he explained that some of the common objectives are investing for long term capital gains . . ."

Mr. Willard interrupted to explain, "That means investing in stocks and holding them, believing that they will grow in value through the years."

"Or investing for income, or speculating for quick profits," Georgia continued, referring to the notes she had taken during her conversation with Mr. Foresight.

Mr. Willard explained again. "Investing for income means choosing a stock that pays a high dividend. Speculating means buying some little known stock, in the hope that it will become very popular soon and that the price will go up. Then when you sell your holding, you make a big profit."

The class murmured happily at the thought of such success.

"It is difficult to do that unless you are very familiar with the stock market—and even then it doesn't always work out the way you would want. Well, Georgia, did you buy any stocks yesterday?"

"No, not yet," Georgia replied. "First, I had to open an account with the brokers' office. That was something like opening a savings account at the bank. Then Mr.

Foresight gave me some information to read on several stocks, and said I could call him whenever I was ready to invest. But he said I would have to pick the stock myself. It's my own decision."

Mr. Willard was amused. "He wants you to make the final selection so that if the investment proves unsatisfactory to you, it was your choice and not his!"

After reading the material about different companies that Mr. Foresight had given her, Georgia decided to invest for long term capital gains. She decided on a hospital supply company, because she had read that in the coming years, health care in hospitals and nursing homes would be one of the nation's largest industries. The stock of United Hospital Equipment was selling for $16\frac{1}{8}$. So Georgia called Mr. Foresight.

"I want to buy 30 shares of United Hospital Equipment," she said.

"Fine," replied Mr. Foresight. "I have your order slip, and I'll send it right away to our order clerk. He will transmit it as quickly as possible to our firm's representative on the floor of the New York Stock Exchange, where this stock happens to be listed. Our representative will arrange the purchase at the best price available, and then send a message to me. I'll call you back when I hear from him."

One hour and 23 minutes later, he called back.

"Your order for 30 shares of United Hospital Equipment has been executed at $15\frac{7}{8}$. That means \$15.875 per share. We will bill you for that amount plus our commission of \$14 and you should send or bring us the money within five business days. OK?"

Georgia was thrilled almost speechless. "Yes, OK! Thank you!"

"Just think," she said to herself, "I'm a stockholder. I own part of a corporation."

After she told the Biz-Con class the next day, Mr. Willard sounded very proud of her.

"Well, Georgia, it looks like you're on your way to becoming the world's richest woman. I think the whole class is happy for you."

Georgia smiled broadly at her classmates who looked at her with admiration. All except Roger Haston. He was sitting in the corner alone. It looked like he was designing posters of some sort.

Research/Discuss

A discussion involving these questions should present some basic ideas in buying and selling stock. Since students will probably not be familiar with many investment terms yet, keep the discussion general and avoid terminology wherever possible.

COMMON STOCKS

CHAPTER 24

RESEARCH/DISCUSS

- ☐ *When they sell a stock at a higher price than they paid for it; when a stock pays a dividend.*
- ☐ *When they sell stock at a lower price than they paid for it. This can happen if they buy and sell at bad times. Investors can also lose money if they buy speculative stocks and the companies do not prosper.*
- ☐ *People who say this are usually speculating, trying to make a quick profit by short-term trading. Very few investors, except for professionals, are successful at this activity.*
- ☐ *Any time you take a risk, you're gambling. And all investments involve some degree of risk. However, you can minimize the risk by buying carefully and avoiding speculation.*

- ☐ How do investors make money in the stock market?
- ☐ How do investors lose money in the stock market?
- ☐ What do people mean by "playing the market?"
- ☐ Is investing in stocks a form of gambling?

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ to read stock market quotations
- ☐ how to find the cost of board lot and odd lot purchases and sales
- ☐ how commissions are figured on purchases and sales of stock
- ☐ to compute yields and price/earnings ratios
- ☐ how unlisted securities are bought and sold



WHONNOCK INDUSTRIES LIMITED

INCORPORATED IN THE PROVINCE OF BRITISH COLUMBIA

AUTHORIZED TO ISSUE: 4,000,000 COMMON SHARES WITHOUT NOMINAL OR PAR VALUE DIVIDED INTO 3,673,898 CLASS "A" COMMON SHARES WITHOUT NOMINAL OR PAR VALUE AND 326,102 CLASS "B" COMMON SHARES WITHOUT NOMINAL OR PAR VALUE.

This Certifies that

****MRS VICTORIA P CROUCHER****

AB11100

200

is the registered holder of

FULLY PAID AND NON-ASSESSABLE CLASS "A" COMMON SHARES WITHOUT NOMINAL OR PAR VALUE IN THE CAPITAL OF

Whonnock Industries Limited, subject to the Memorandum and Articles of Association of the company, hereinafter referred to as the company, together with the rights, special rights and restrictions attaching to these shares as set forth in the reverse side hereof. This certificate is not valid until countersigned by a Transfer Agent and Registrar of the company.

In Witness Whereof, the company has caused this certificate to be signed by the facsimile signatures of its duly authorized officers and to be sealed with its common seal.

Dated **MAY 16 1973**

[Signature]
PRESIDENT

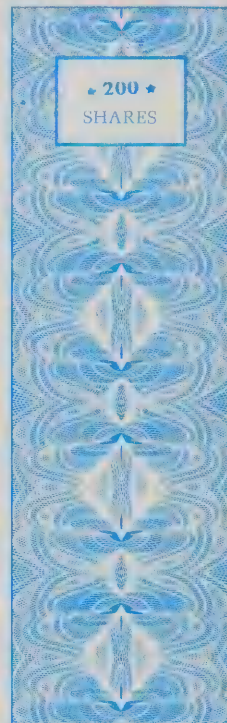
[Signature]
CHAIRMAN OF THE BOARD

Countersigned and Registered
THE CANADA TRUST COMPANY,
Transfer Agent and Registrar

Vancouver,
Calgary, Regina,
Toronto, Montreal

By

[Signature]
Authorized Officer
The shares represented by this certificate are transferable
at the offices of The Canada Trust Company, in Vancouver,
Calgary, Regina, Toronto and Montreal.



One way for a corporation to raise money is to issue common stock. The purchaser of the stock receives a certificate like the one shown above.

① This certificate was issued to Mrs. Victoria P. Croucher by Whonnock Industries, a company listed on the Canadian Stock Exchange with the symbol Whonok.

② This certificate is for 200 shares. Since common stock is "voting" stock, the owners have 200 votes at any stockholders' meeting.

③ The number of this certificate AB11100, the owner's name and address, and the number of

shares were registered by both a transfer agent and a registrar. The registrar and transfer agent was The Canada Trust Company. Canada Trust is not involved in the purchase of the stock; it merely maintains the records of the current stockholders and the number of shares held by each. If Mrs. Croucher sold her 200 shares of stock, the certificate would be sent to the transfer agent. He would issue new certificates for the new owners. Then the registrar would remove Mrs. Croucher's name from his records and register the names of the new owners.

Discussion Question: What should you do before you invest in stocks?

Consider: Getting advice from a reputable broker; getting the facts about the company; providing first for family emergencies; and so on.

There are several abbreviations in the stock quotations that are not explained in the text. A knowledge of these is not necessary for a basic understanding of stocks. This information is available with the stock quotations in The Financial Post.

Have students prepare graphs showing the fluctuations of closing stock prices.

Stockholders are the owners of a corporation. Each *share* of stock represents one unit of ownership in the company. The purchase and sale of stock is handled primarily in organized stock exchanges. Our Canadian exchanges are in Calgary, Winnipeg, Montreal, Toronto, and Vancouver. A stock exchange is merely a market place where buyers and sellers can meet. The exchange does *not* buy, sell, or fix the price of stocks. Prices are the result of the action or demand for, and supply of, the stocks which are marketed.

The current value of stocks is published each day. Here is part of the stock quotations from *The Globe and Mail*, showing stock transactions for one day on the Toronto Stock Exchange.

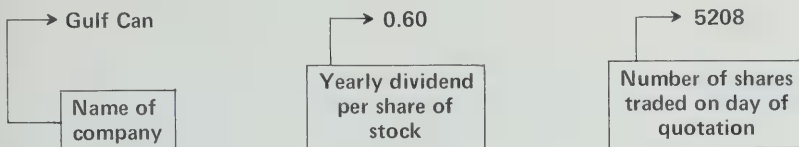
Toronto

QUOTATIONS FOR MAY 16, 1974, PREPARED BY THE TORONTO STOCK EXCHANGE

1974										1974										
High Low		Stock	Div	Days		High Low	Close	Ch'ge	Vol	High Low		Stock	Div	Days		High Low	Close	Ch'ge	Vol	
470	390	Abby Glen		395	390	390	—10		790	68	40	Goldray		47	47	47	+ 2		2000	
220	100	Aby Gln w		100	100	100	—10		100	64	6	G Mckay A	.50	\$6 1/2	6 1/2	6 1/2	— 1/8		400	
143 1/4	10 1/8	Abfibi	p.32 1/2	\$11 1/8	11	11			3933	28 1/4	21 1/8	Graft G	.48	\$26	25 1/8	25 1/8	— 7/8		425	
13 1/2	11	Acklands		.32	\$12	12	12	+ 1/2	200	395	220	Granduc		229	220	220	— 5		2000	
11 1/4	8 1/8	Acres Ltd		20	\$8 1/8	8 1/8	8 1/4	+ 1/4	130	10 1/4	8 1/2	Granite	v.32	\$9 1/4	9 1/4	9 1/4	— 1/4		266	
44	39 1/4	Acres A pr	3.60	\$39 1/2	39 1/2	39 1/2			270	11 1/8	7 1/2	Gt Oil Sds		\$7 1/4	7 1/4	7 1/4	+ 1/4		2074	
160	36	Acres wt		39	39	39		+ 1	1000	288	160	GL Nickl		\$65	163	165			1100	
375	200	A.G.F.M.	p.31	220	220	220	+10		100	26	23 1/2	GL Paper		\$23 1/8	23 1/2	23 1/2	— 3/8		550	
11 1/8	6 1/2	Agnico E		58	7 1/2	8	8	+ 1/2	8850	8 1/2	5	GL Pap w		55	5	5	— 1/2		150	
10 1/8	5 1/4	Agra Ind		20	\$6 1/4	5 1/4	6	— 1/8	4900	38	26 1/4	Gr Plains	.50	\$38	35 1/2	38	+ 4 1/4		10475	
284	145	Akaitcho	p.25	182	165	185	+20		6800	68 1/2	58 1/4	Gt W Life	2.50	\$58 1/2	58 1/2	58 1/2	— 1/2		200	
8	480	Alt East G		42	\$5 1/8	480	5	— 1/8	14300	470	310	Gt West S		445	440	440			600	
14	10 1/4	Alfa Gas A	4.25	\$11 1/8	11 1/8	11 1/8	— 1/8		3983	135	90	G West wtl		110	110	110	+ 5		200	
71	58	Alfa G C P	4.75	\$58 1/4	55		55		240	15 1/8	11 1/4	Grab I B	.32	\$14 1/4	14 1/4	14 1/4	+ 1/4		300	
24 1/4	22 1/2	Alfa G E P	1.93	\$22 1/4	22 1/4	22 1/4	— 3/4		200	300	175	Green A L		175	175	175			200	
40 1/4	28 1/2	Alcan	v.120	\$32 1/4	28 1/2	28 1/2	— 4		34708	18 1/4	15 1/8	Greyhd		\$5 1/4	16 1/8	16 1/8	— 1/4		1200	
25	21 1/4	Alcan pr		\$22	22	22	— 1/2		130	16 1/4	15 1/8	GSW O		\$5 1/4	5 1/4	5 1/4			300	
26 1/4	19 1/2	Algoma St	1.00	\$25 1/8	25 1/2	25 1/2	+ 1/4		10455	11 1/8	7 1/8	Guar Trst	.56	\$7 3/8	7 1/4	7 3/8	+ 1/4		848	
365	285	Alf-Can B		300	300	300	—10		300	37 1/8	25	Gulf Can	.60	\$25 1/8	25 1/2	25 1/4	+ 5/8		5208	
12 1/2	7	Allarco Dv		89	9	9	+ 1/8		1000	152	53	Gulfstream		68	63	66	+ 1		3000	
7 1/8	5	Almex	p.24	\$5 1/2	5 1/8	5 1/8			10600	470	240	Hambro C		250	250	250	— 5		3915	
280	181	Am Bonza		190	181	189	— 6		2940	87	420	H Group	.28	450	420	420	—55		400	
110	62	Am Larder		76	72	76	+ 4		1500	11 1/2	9 1/4	Ham Tr	.44	\$9 1/4	9 1/4	9 1/4			100	
120	76	Am Eagle		100	92	100	+ 2		4900	19	16	Ham Tr pr	.70	\$15 1/4	15 1/4	15 1/4			260	
16 1/2	11	A Quasar P		\$12	11 1/4	12			200	475	400	Hand Chm	.20	400	400	400			300	
23 1/2	12 1/8	Andres W	.30	\$12 1/8	12 1/8	12 1/8	— 1/8		100	125	100	Hardee		103	101	101	— 2		2575	
23	16	Anglo-cn	1.00	\$20 1/4	20 1/8	20 1/8	—11 1/8		1300	7 1/8	5 1/8	Hard Crp A	.28	56	6	6			100	
32 1/2	29	Ang CT Dev	2.65	\$29 1/2	29 1/2	29 1/2			17600	10 1/2	6 1/2	Harlequin	.30	\$12 1/2	12	12	— 1/2		500	
155	85	Ang U	.85	152	143	145	—5		4610	10 1/2	6 1/2	Harris J S	p.10	110	9 1/2	10	+ 1/8		600	
32 1/2	23 1/2	Aquitane	p.30	\$23 1/8	23 1/4	23 1/4			4610	7 1/2	480	Hawker S	.32	\$5 1/4	5 1/4	5 1/4			400	
34	27 1/4	Argus B pr	p.270	\$28	27 1/4	27 1/4	— 1/4		1075	7 1/8	6	Hayes D A	.24	\$6 1/4	6	6			100	
16 1/8	9 1/4	Asamera	p.60	\$11 1/4	11 1/4	11 1/4	— 1/2		2900	495	385	Homco Ind	.20	410	410	410	+10		500	
20 1/4	16 1/2	Asbestos		\$17 1/8	17 1/8	17 1/8	— 1/8		174	33 1/4	30 1/4	Home A	.50	\$33 1/4	32 1/4	33 1/4	+1 1/4		6948	
123 1/4	8	Ashland C		\$8 1/8	8	8	— 1/2		660	335	159	Houston O		180	160	180	+20		7600	
245	92	Asoc Porc		151	147	151			2909	6	480	Hoden DH		\$5 1/2	5 1/2	5 1/2	+ 1/8		200	
19	14 1/4	Atco A	.15	\$15 1/4	15		15		300	27 1/8	19 1/2	Huds Bay	1.60	\$22 1/2	20 1/4	20 1/4	— 1/4		940	
26	10	Atlas Yk		15	10	15	+ 4		21500	60	17 1/8	H Bay Co	.80	\$17 1/8	17 1/8	17 1/8	— 1/4		1638	
7	430	Auto El	p.05	480	480	480	—10		10	313 1/4	20 1/4	Huron Eri	1.20	\$21 1/2	21	21 1/2	+ 1/4		1160	
11 1/2	8	Auto Hard A	.48	\$11 1/2	10 1/4	11 1/2	+1 1/8		2200	230	143 1/4	Husky Oil	.30	\$16 1/8	15 1/4	15 1/4	— 1/4		2474	
7	5	Bad Boy	.06	\$5 1/4	5 1/4		5 1/4		100	41 1/2	36 1/8	Husky A pr	3.00	\$33 1/4	36 1/4	36 1/4			740	
19	11 1/8	Banister C		\$12	12	12			3030	8 1/4	50	Husky D w		125	99	99	+ 7		9944	
5 1/2	275	Bankeno		300	285	290	— 5		3030	10 1/8	5 1/4	Husky E w		\$6 1/2	6 1/2	6 1/2	— 1/4		400	
23 1/2	12	Bank B C	.50	\$22 1/4	22 1/4		22 1/4		240	150	32	Hydra Ex		20	470	450	455	+12		13000
21	16 1/8	Bank Atli		\$17	16 1/8	16 1/4	— 1/8		8805	20 1/8	14 1/4	IAC A	.96	\$15 1/4	15 1/8	15 1/8	+ 1/8		1340	
41 1/4	31 1/4	Bank N S	1.20	\$32 1/4	31 1/4	31 1/8	— 3/4		5647	60	50 1/4	IAC A/2	p.450	\$49	49	49			225	
20	17 1/8	B Cdn Nat		\$17 1/8	17 1/8	17 1/8			910	33 1/4	26 1/8	Imasco	x1.30	\$26 1/8	26 1/8	26 1/8	— 7/8		600	
34	30	Baror-El	1.40	\$32 1/2	32 1/2		32 1/2		200	42 1/2	27 1/8	Imp Oil A	.80	\$28 1/8	27 1/8	27 1/8	— 3/4		1400	
7 1/2	435	Baton B		445	435	435	—15		1200	14	10	Indal Can	.80	\$11	11	11			121	
495	350	Beav Eng	.18	375	350	350	—50		200	13 1/4	9	Inland Gas	.72	\$9 1/4	9	9 1/4			1021	
5 1/2	320	Becker B P	.15	355	355	355	+25		200	13 1/4	10 1/8	Inland G p	1.00	\$10 1/4	10 1/4	10 1/4	— 1/8		500	
8 1/4	7 1/8	Belding L	n.66	\$7 1/8	7 1/8		7 1/8		100	6 1/4	415	Inter-City	.20	470	450	455	+15		3500	
44 1/8	39 1/8	Bell Canad		312	341 1/4	41	41 1/4	+ 1/8	6501	16 1/4	14 1/4	Inter C A p	1.30	\$15	15	15			1900	
46 1/4	41 1/4	Bell A		320	341 1/4	41 1/4	41 1/4	— 1/4	185	410	220	Inter C B w		250	240	240	—36		1000	
47 1/2	43 1/2	Bell B pr		334	43 1/2	43 1/4	43 1/8	— 1/4	425	495	380	Intermetco		395	395	395			400	
30 1/2	28 1/4	Bell C pr		225	29	28 1/4	28 1/4	— 1/4	880	250	208	IBM	v5.12	\$209	209	209	— 1		121	
16 1/2	11 1/4	Beth Cop	x.80	\$11 1/4	11 1/8	11 1/8			450	11 1/8	7 1/2	Int Mogul	.25	\$7 1/2	7 1/2	7 1/2			1111	
36	12 1/2	Big Narma		19	19	19	— 1		3000	39	27 1/8	Inco	v1.40	\$28	27 1/2	27 1/4	— 3/4		24180	
80	42	Bl Hawk		45 1/2	45 1/2	45 1/2	—2 1/2		450	68	26	Int Obaska		44	42	44	+ 1		6500	
5 1/2	360	Black P A	p.16	375	360	360	—30		450	15 1/8	10 1/4	Interpool		\$11 1/2	11 1/4	11 1/4	— 1/4		400	
385	320	Block Bros	p.21	325	325	325	+10		1100	270	250	Int Div		250	250	250			4600	

table 24.1

Notice that the names of the corporations are abbreviated. For example, The Gulf Oil Company of Canada is represented as Gulf Canada. Look at the Gulf Can entry line under the column of Stock, Div, and Vol.



In this information, the stock is being described by the amount of dividend the company pays each year. The 0.60 means that the current dividend payment by the company is \$0.60 each year for each share of stock. If you owned 100 shares of the stock, your dividend would be $100 \times \$0.60$ or \$60 for this year.

The volume column shows the number of shares traded (bought and sold) on the exchange that day. Stocks are quoted in most Canadian daily newspapers as the exact number of shares traded that day. *The Financial Post*, reporting weekly, quotes the volume in 100's. Our *Globe and Mail* entry for Gulf Oil of Canada shows 5208 shares traded on one day on the Toronto Stock Exchange. *The Financial Post* of the same date, but giving a weekly summary for all Canadian exchanges and reporting volume in 100's, quoted 361 or (361×100) 36 100 shares traded.

FACTS AND FIGURES

TORONTO STOCK EXCHANGE

There are 126 seats on the Toronto Stock Exchange. These may be held by corporations, partnerships, or sole proprietorships meeting the requirements laid down by the exchange. No firm or sole proprietorship may hold more than three seats.

In 1972, the Toronto Stock Exchange handled 1 940 750 transactions involving 635 885 589 shares with a market value of \$6 258 151 656. This represented 68.7 percent of the dollar value of trading on all six Canadian exchanges and 33.8 percent of the total number of listed shares traded.

Facts & Figures

Contact the exchange serving your area and secure the latest figures for annual transaction volume.

Inquire also of the number of seats on your exchange and the selling price of the last seat sold to the most recent member.

EXERCISES Use table 24.1.

1. Which common stock shown traded the most? **Imperial Oil**
2. Which traded the least? **Barbr-Ell**
3. Which stocks are listed as paying dividends of over \$4.00 per share? **Alta G.C.; I.A.C; IBM**
4. What are the two stocks showing the lowest dividend? **Auto El; Bad Boy**
5. Can you name some stocks that have not as yet declared a current dividend?

24 b / STOCK PRICES

Point out that stock prices are affected by economic conditions, political events, war and peace, strikes, disasters, rumours, and so on.

Discussion Question: Why do people invest in stocks?

Consider: To obtain income; to make profits (capital gains); to provide a hedge against inflation.



Stock prices are determined like an auction, where the bids and offers are influenced by supply and demand. Thus, if a stock is in demand (many people want to buy it), the price goes up.

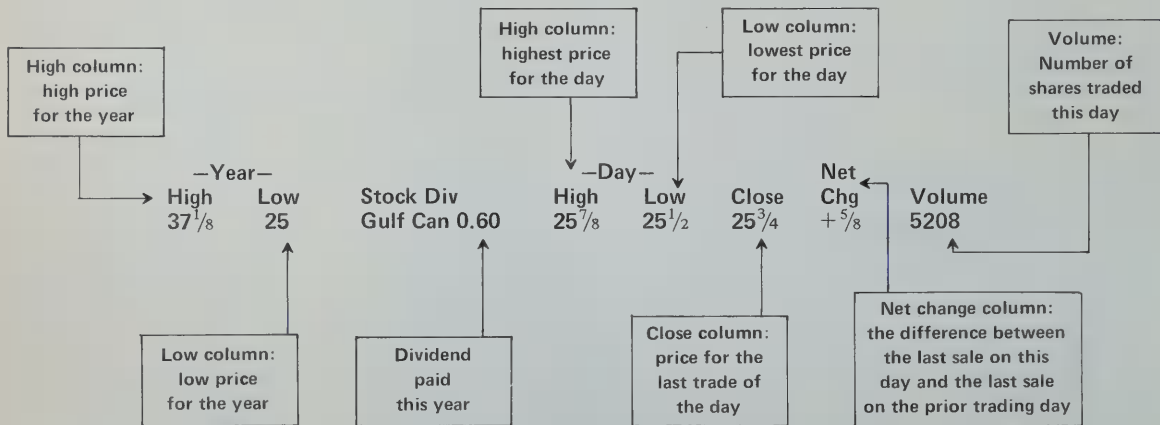
The prices of stocks are quoted as dollars and cents or as *points*, depending on the share value and type. When an industrial stock costs less than \$5.00, it is quoted in dollars and cents. If the price is over \$5.00, it is quoted in points, with the smallest change being recorded at $\frac{1}{8}$ of a point.

$$\frac{1}{8} \text{ of a point} = \frac{1}{8} \text{ of a dollar} = \$0.125$$

For example, a bid of $32\frac{3}{8}$ is a bid of \$32.375 per share.

$$\begin{array}{lll} \frac{1}{8} = 0.125 & \frac{3}{8} = 0.375 & \frac{5}{8} = 0.625 \\ \frac{2}{8} = \frac{1}{4} = 0.25 & \frac{4}{8} = \frac{1}{2} = 0.50 & \frac{6}{8} = \frac{3}{4} = 0.75 \\ & & \frac{7}{8} = 0.875 \end{array}$$

Look at Gulf Can:



A stock with a wide price range is called a volatile stock. Have students find several volatile stocks in the listings on page 322.

EXAMPLE

From table 24.1, find the closing price of 100 shares of INCO (International Nickel Company of Canada).

The quoted closing price is $27\frac{1}{4}$. Find the price per share.

$$27\frac{1}{4} = \$27.25$$

Multiply by 100.

$$100 \times \$27.25 = \$2725$$

■ The closing price for 100 shares of INCO is \$2725.

EXAMPLE

The difference between the year's high and low is called the range. From table 24.1, find the range for the Hudson's Bay Company.

The year's high is 20; the low is $16\frac{3}{8}$. Subtract.

$$20 - 16\frac{3}{8} = 3\frac{5}{8}$$

- The range is $3\frac{5}{8}$.

Point out that an investor should try to buy a stock when it is close to the low of its price range.



The floor of the Toronto Stock Exchange is always a busy place, with members, brokers, agents, and employees. The electronic ticker tape, listing the most recent prices, can be seen at the top of the picture.

Photograph courtesy of the Toronto Stock Exchange.

EXERCISES Find the required stock prices from table 24.1.

STOCKS	NUMBER OF SHARES	TRANSACTION	STOCKS	NUMBER OF SHARES	TRANSACTION
1. Abitibi	100	High \$1112.50	2. Albany	400	Close \$1680.00
3. Andres W	300	Close \$3712.50	4. Atlas YK	600	Low \$6000.00
5. Bank MTL	500	High \$8500.00	6. Beavr Eng	100	High \$375.00
7. Goldray	600	Close \$2820.00	8. Granisle	200	Low \$1850.00
9. Guar Trst	100	High \$737.50	10. HB Oil Gas	700	Low \$2030.00
11. Imasco	100	High \$2662.50	12. Intrpr Pipe	200	Low \$3150.00

Find the range for the following.

13. Bank B.C. \$1.50	15. IAC \$5.75	17. Interpool \$4.62
14. Bank N.S. \$10.00	16. Indal Can \$4.00	18. Ipsco \$4.25

24 C / BUYING ODD LOTS

Point out that many former odd lot buyers are now buying mutual funds. This means their investment decisions are made by professional managers. Discuss the other advantages of buying mutual funds for the small investor.

Discussion Question: What should the small investor's primary considerations be in investing?

Consider: Safety of principal; diversification; reasonable price; reasonable return.

To emphasize the importance of diversification to the small investor, discuss what happens to a stockholder when a company loses money. Discuss several industries that have experienced reverses, such as several car manufacturers, wagon makers, and so on. Point out how other related industries were affected by these reverses.

A *board lot* is the regular unit of trading. For industrial stocks the board lots are as follows:

- for shares selling under \$25 the board lot is 100,
- for shares over \$25 but under \$100 it is 25, and
- for shares selling over \$100 the board lot is 10.

Although orders on the floor of the exchange are made in board lots, a buyer may obtain less than a board lot through a broker who will combine orders. The broker will buy in board lots and break them up into smaller lots for small investors. These, other than board lots, are called *odd lots*. On odd lot transactions, there is usually a price differential amounting to $\frac{1}{8}$ to $\frac{1}{4}$ point because of the extra work involved. If the price of the share is between \$2.00 and \$5.00, the odd lot fee is \$0.10 per share; if the price is between \$5.00 and \$60, the extra fee is $\frac{1}{8}$ of a point or \$0.125; and if the share price is in excess of \$60, the fee is $\frac{1}{4}$ point or \$0.25 per share.

EXAMPLE

Find the cost of 20 shares of DOME at a price of $51\frac{1}{4}$.

Find the price per share.

$$51\frac{1}{4} = \$51.25$$

Since the price per share is less than \$60, the odd lot fee per share is $\frac{1}{8}$ of a point. Find the odd lot price per share.

$$\$51.25 + \$0.125 = \$51.375$$

Find the cost of 20 shares.

$$20 \times \$51.375 = \$1027.50$$

- The cost of 20 shares is \$1027.50.

EXERCISES Find the cost of these odd lots of common stock.

BOARD LOT			BOARD LOT		
SHARES	STOCK	PRICE	SHARES	STOCK	PRICE
1. 20	Ford Motor	$52\frac{1}{8}$ \$1045.00	2. 15	McKenzie Oil	$72\frac{3}{4}$ \$1095.00
3. 10	Columbia Gas	$28\frac{1}{2}$ \$286.25	4. 35	B.C. Transport	$39\frac{3}{8}$ \$1382.50
5. 40	Canadian Steel	$40\frac{1}{4}$ \$1615.00	6. 25	Westinghouse	$69\frac{5}{8}$ \$1746.88
7. 50	Anaconda Copper	$29\frac{7}{8}$ \$1500.00	8. 25	Safeway	27 \$678.13
9. 10	Maritime Can	$60\frac{1}{2}$ \$607.50	10. 25	Alberta Power	$33\frac{7}{8}$ \$850.00
11. 15	F. W. Woolworth	$29\frac{3}{4}$ \$448.13	12. 30	Bethlehem	$31\frac{7}{8}$ \$960.00
13. 25	C.I.T. Coproration	35 \$878.13	14. 28	United Fruit	$60\frac{1}{8}$ \$1690.50
15. 33	Wills	$135\frac{7}{8}$ \$4492.13	16. 50	Alcoa	$80\frac{3}{8}$ \$4031.25

The seller of a board lot (100 shares) receives the amount that the buyer pays for the stock. However, when stock is sold in odd lots, the seller must pay an odd lot fee. This fee is deducted from the proceeds of the sale. The odd lot fee per share for selling stock is the same as the odd lot fee per share for buying stock.

Inexperienced investors tend to buy when the market is rising and sell when it is falling. Professional investors tend to buy when the market prices fall and sell when they rise.

EXAMPLE

Find the proceeds to the seller if an odd lot of 16 shares of Alberta Transfer Company is sold. The board lot price per share is $30\frac{1}{4}$.

Find the board lot proceeds per share.

$$30\frac{1}{4} = \$30.25$$

Since the board lot is selling under \$60, the odd lot fee is $\frac{1}{8}$ of a point. Find the odd lot proceeds per share.

$$\$30.25 - \$0.125 = \$30.125$$

Find the proceeds from 16 shares.

$$16 \times \$30.125 = \$482$$

- The seller receives \$482.

EXAMPLE

Find the proceeds to the seller if an odd lot of 30 shares of General Motors Corporation is sold. The board lot price is $83\frac{1}{2}$.

Find the board lot proceeds per share.

$$83\frac{1}{2} = \$83.50$$

Since the board lot is selling over \$60, the odd lot fee is $\frac{1}{4}$ of a point. Find the odd lot proceeds per share.

$$\$83.50 - \$0.25 = \$83.25$$

Find the proceeds from 30 shares.

$$30 \times \$83.25 = \$2497.50$$

- The seller receives \$2497.50.

Project: Find out from a broker what happens when a share of stock is bought or sold on a Canadian exchange. Who is involved? In what capacity?

EXERCISES Find the proceeds to the seller for the sale of these board lots and odd lots.

		BOARD LOT				BOARD LOT	
SHARES	STOCK	PRICE		SHARES	STOCK	PRICE	
1. 100	R. H. Macy	$36\frac{3}{8}$ \$3637.50		2. 200	Dictaphone	$25\frac{3}{4}$ \$5150.00	
3. 5	General Foods	$72\frac{1}{8}$ \$359.38		4. 10	Pacific Gas & El	$32\frac{5}{8}$ \$325.00	
5. 12	Brunswick	$17\frac{1}{4}$ \$205.50		6. 15	Atlantic Sugar	$98\frac{7}{8}$ \$1479.38	
7. 20	Kellogg	$39\frac{3}{4}$ \$792.50		8. 25	O'Lear Aircraft	$17\frac{3}{4}$ \$440.63	
9. 30	N.T. Express	$50\frac{1}{8}$ \$1500.00		10. 33	Thrift Drug	$17\frac{5}{8}$ \$577.50	
11. 35	Zenith Radio	44 \$1535.63		12. 40	B.C. Construction	$39\frac{1}{2}$ \$1575.00	
13. 45	N.S. Gypsum	$70\frac{1}{4}$ \$3150.00		14. 50	Warner Lambert	$64\frac{3}{8}$ \$3206.25	
15. 60	Economy Stores	$26\frac{1}{4}$ \$1567.50		16. 75	Diners Club	$30\frac{3}{4}$ \$1546.88	

Brokers charge commissions when they buy and sell stock for their customers. The commission rate is the same for both buying and selling. The amount of the commission for each transaction depends on the amount of money involved. This in turn depends on the number of shares traded and the price per share.

Table 24.2 shows the commissions charged by the member firms of the stock exchanges in Canada. Full details of all charges are outlined in the Manual of New Canadian Commission Rates available at all exchange offices. This portion deals with orders having total value of \$20 000 or less.

1. BASIC FORMULAE FOR THE NEW RATE SCHEDULE

The bases for the calculation of commissions on all orders with values of \$20 000 or less are as follow:

- (1) On shares selling under \$14:
the base rate applicable to the first \$20 000 of each order is 2.50% of the value of the order.
- (2) On shares selling over \$30:
the base rate applicable to the first \$20 000 of each order is 1.64% of the value of the order.
- (3) On shares selling at \$14 up to and including \$30:
the formula applicable to the first \$20 000 for each order is as follows—0.8875% (0.008875) of the order value plus \$0.22575 per share.

table 24.2

EXAMPLE

Find the commission on the sale of 100 shares of Alcan at $53\frac{7}{8}$.

Find the money value of 100 shares.

$$100 \times \$53.875 = \$5387.50$$

Refer to table 24.2 for the commission rate.

Since the value of the shares is \$30, the commission rate is 1.64% of the value of the order.

Find 1.64% of the money value.

$$1.64\% = 0.0164$$

$$0.0164 \times \$5387.50 = \$88.36$$

■ The commission fee is \$88.36

Project: Obtain a copy of a local newspaper every day for a week. Select three common stocks and prepare a report on their market activity for the week.

FACTS AND FIGURES

When a young person commences a career as a stockbroker, the first one or two years is usually training time. While on an educational course, a salary is provided so the trainee does not rely only on earned commissions while studying. These early earnings may be charged against later earnings.

Brokerage firms are anxious to develop competent and well trained personnel. They offer young people every encouragement to enter their profession.

Facts and Figures

Have you ever considered "stockbroker" as a career?

What are the incentives?

EXAMPLE

Find the commission on the purchase of 500 shares of EG&G at 23¼.

Find the money value of 500 shares.

$$500 \times \$23.25 = \$11\,625$$

Refer to table 24.2 for the commission rate.

Since the price per share is between \$14 and \$30, the commission is 0.8875% of the total order plus \$0.22575 per share.

Find 0.8875% of the total value.

$$0.008875 \times \$11\,625 = \$103.17$$

Add \$0.22575 per share.

$$\$0.22575 \times 500 = \$112.87$$

■ The commission is $\$103.17 + \$112.87 = \$216.04$.

Project: Find out what federal or provincial regulations there are governing sales of securities.

EXERCISES Find the commission for each purchase or sale.

TRANSACTION	SHARES	STOCK	BOARD LOT PRICE	
1. Purchase	100	Pepsi-Cola	48½	\$79.54
2. Purchase	100	Manitoba Zinc	19⅝	\$39.99
3. Sale	200	Conrad Mining	98⅜	\$322.67
4. Sale	300	Shell Oil	53¼	\$261.99
5. Purchase	200	J. C. Penney	51¼	\$168.10
6. Sale	300	Republic Steel	37	\$182.04
7. Purchase	100	Walgreen Drug	24¼	\$44.10
8. Purchase	100	Transatlantic	23⅝	\$43.54
9. Sale	400	Ford Motor	43⅛	\$282.90
10. Sale	200	General Motors	76⅞	\$252.15

Discuss the qualifications necessary for a business to have its stock listed on a Canadian exchange.

The stocks of many corporations are not listed in any Canadian stock exchange. The stock of these companies is traded in what is called the *unlisted* market or the *over-the-counter* market. The trading is facilitated by a telephone network connecting the participating brokerage offices. Information on this market is available from The Investment Dealers Association of Canada.

Table 24.3 shows part of the Unlisted Industrials as published in *The Financial Post*. The quotations do not represent actual transactions. The price of a stock depends on whether it is being bought or sold. If an investor purchases a stock, he pays the "asked" price. If he sells a stock, he receives the "bid" price.

Since the "bid" and "asked" prices are subject to change, an investor has no guarantee that he can obtain a security at the "asked" price. If the investor does not want to pay more than a certain price, he can enter a *limit* order. If this price is not available, there is no sale.

table 24.3

UNLISTED INDUSTRIALS					By Pemberton Securities Ltd., Vancouver				
May 13, 1974					May 10, 1974				
As supplied by the Investment Dealers' Association of Canada					Bid Asked				
By Pitfield, Mackay, Ross & Co. Ltd.									
High	Low		Bid	Asked					
2.60	2.15	AGF Special ..	2.18	2.23	Block Bros. Indust. warr. .	6.00	8.00		
1.50	1.00	AGT Data	...	1.50	Chinook Shop. Centre com. .	2.75	...		
5.00	5.00	Abbey Life	5.00	...	Elk Creek Water com.	5.50	...		
.65	.35	Anthex	.35	.45	Okanagan Hel. 6% Pref.	7.00	7.75		
1.25	.80	Atl. Sugar wts	.90	1.15	Do. 6% Cv. 2nd	12.00	...		
18.50	12.00	Atlantic Trust	18.00	...	Do. warrants	...	3.25		
.90	.50	Autocrown	.75	1.00	Okanagan Tel. 40c Pref.	4.50	5.25		
...	...	BIF Corp "A"	.90	1.15	Seaboard Life Ins. com.	1.25	1.75		
1.30	.80	Bodi-Gard	1.00	1.25					
8.50	6.25	Cdn Gas B wts	6.25	6.75					
28.00	17.00	Carvern pfd ..	18.00	20.00					
2.35	1.70	Do. com.	1.80	2.00					
19.00	17.00	Central N.S. Tr.	17.00	...					
7.50	7.00	Comm. Finance	7.00	...					
...	...	Cons. Comp. Inc.	.25	.50					
...	...	Do. Spec.	.25	.50					
1.30	1.00	Cont. Research	1.25	1.75					
2.00	1.50	Corp. Props ..	1.75	2.25					
2.50	1.75	Creat. Patents	...	2.25					
.40	.15	Daniel Div	.20	.30					
5.25	4.00	Dataline	4.00	4.50					
.60	.60	Diversified Cred.	.60	...					
90.00	90.00	Dominion Life	90.00	...					
14.50	14.00	Evang. Savings	14.00	...					
.30	.20	Fathom	.20	.30					
.35	.60	Flemdon	.60	.60					
.20	...	Foranest	...	.25					
15.00	15.00	Goderich Elev.	15.00	...					
11.50	8.50	Henn Brew com.	9.00	11.00					
1.25	.75	Highland Queen	1.00	1.50					
.35	.40	In-Mark	.55	.65					

UNLISTED INDUSTRIALS				
May 9, 1974				
Weekly Summary				
Provided by Investment Dealers Association				
Ontario Securities Only				
Industrial Weekly Summary				
Stocks	Sales	High	Low	
AGF Special	1,400	2,270	2,210	
Anglo Keno	2,500	.200	.170	
Avco Finance pfd	818	85,000	82,000	
Carvern Intl com	7,950	2,000	1,750	
Cons Comp com ..	1,000	.500	.500	
Do Spe	840	.450	.450	
Daniel Div	13,500	.350	.250	
Dataline	500	4,250	4,250	
Diversified Credit	2,500	1,400	1,300	
Dominion L'holds	1,000	.020	.020	
Flemdon	80	.650	.650	
Guerd Gr pfd	100	7,000	7,000	
Highland Queen ..	400	1,375	1,000	
Inter Br Devel ..	2,100	3,600	3,500	
Intl Systems	5,750	.400	.350	
Jenkins Bros	45	12,500	12,500	
Jonlab Inv.	400	9,500	9,500	
Kingsway Lumber ..	100	9,000	9,000	
Knogo	500	.300	.300	

In the unlisted market, there are no board lots or odd lots. To find the cost of buying stock,

- (1) multiply the number of shares purchased by the “asked” price,
- (2) add the commission.

To find the proceeds to the seller of unlisted stock,

- (1) multiply the number of shares by the “bid” price,
- (2) subtract the commission.

Project. Find out from a broker what happens when a share of stock is bought or sold on the unlisted market. Who is involved? In what capacity?

EXAMPLE

Find the cost of buying 100 shares of DATALINE.

Find the money value of the 100 shares using table 24.3.

The “asked” price is \$4.50.

$$100 \times \$4.50 = \$450$$

Find the commission by table 24.2.

The commission rate is 2.50% of the total order.

$$450 \times \$0.025 = \$11.25$$

Add the cost and the commission.

$$\$450.00 + \$11.25 = \$461.25$$

- The total cost is \$461.25.

EXAMPLE

Find the proceeds from the sale of 70 shares of Atlantic Trust.

Find the money value of the 70 shares using table 24.3.

The “bid” price is \$18.

$$70 \times \$18 = \$1260$$

Find the commission from table 24.2.

The commission rate is 0.8875% of the total order plus \$0.22575 per share.

$$0.008875 \times \$1260 = \$11.18$$

$$\$0.22575 \times 70 = \$15.80$$

The total commission is $\$11.18 + \$15.80 = \$26.98$.

Subtract the commission from the money value.

$$\$1260.00 - \$26.98 = \$1233.02$$

- The proceeds are \$1233.02.

24 g / STOCK DIVIDENDS AND ANNUAL YIELD

Obtain copies of the annual reports of several companies. Have students find the dividends and annual yield. Have them decide whether or not they would want to buy stock in the company.

Most corporations distribute from 40% to 70% of each year's earnings to the stockholders as *dividends*. They retain the rest of the profit for working capital, for research and development of products, and for dividends for low-profit years. The amount of the stock dividend is decided by the board of directors of the corporation.

Dividends are usually paid every three months. The full year's dividends—four payments—is the return on an investment in stocks. It is like the interest that would accrue in a savings account. It can also be expressed in terms of percent, called the *yield*. That is, the yield is the percent of your investment that you receive as income each year. To find the annual yield on a stock investment, divide the annual dividend by the price per share of the stock.

EXAMPLE

Find the annual yield on General Electric common stock if the annual dividend is \$2.60 and the price per share is \$87.

Divide the dividend by the price.

$$\$2.60 \div \$87 = 0.029 = 2.9\%$$

- The annual yield is 2.9%.

EXAMPLE

Find the yield on Union Oil common stock when the quarterly dividend is \$0.35 and the price per share is \$52.

Find the annual dividend.

$$4 \times \$0.35 = \$1.40$$

Divide the dividend by the price.

$$\$1.40 \div \$52 = 0.0269 = 2.7\%$$

- The annual yield is 2.7%.

Mention that a stockholder has no legal right to expect a dividend payment if the board of directors elects not to declare one.

Project: Start with an imaginary \$10 000 and determine how you would invest it in common stocks. After one month, prepare a report on what happened.

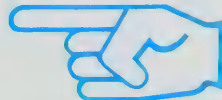
EXERCISES Find the annual yield to the nearest tenth of a percent for these common stocks.

STOCK	QUARTERLY DIVIDEND		PRICE PER SHARE	STOCK	QUARTERLY DIVIDEND		PRICE PER SHARE
1. American Airlines	\$0.20	2.3%	35	2. Beatrice Foods	\$0.25	2.6%	39 ¹ / ₈
3. Chrysler	\$0.50	4.7%	42 ¹ / ₂	4. Detroit Edison	\$0.35	5.7%	24 ³ / ₈
5. Eastman Kodak	\$0.25	1.1%	87 ¹ / ₄	6. Florida Power	\$0.38	3.0%	50 ³ / ₈
7. Gimbel Br	\$0.25	2.2%	45	8. Hilton Hotel	\$0.25	1.5%	64 ⁷ / ₈
9. Int Bus Machines	\$1.00	1.1%	355 ¹ / ₄	10. Jewel Co	\$0.375	2.9%	51 ³ / ₄
11. Kaiser Al	\$0.25	2.7%	37 ¹ / ₂	12. Lockheed	\$0.30	5.0%	23 ⁷ / ₈
13. Maytag	\$0.25	3.6%	27 ⁵ / ₈	14. Canadian Biscuit	\$0.55	4.4%	50
15. Sask Edison	\$0.375	5.9%	25 ¹ / ₂	16. Pacif Tel & Tel	\$0.30	6.0%	19 ⁷ / ₈

Investment analysts use many different tests and measurements to determine the quality of a stock for investment purposes. In addition to the annual yield, one of the most common tests is the *price/earnings ratio*. The price/earnings ratio (P/E ratio) is the ratio of the price per share to the earnings per share.

Mention that free literature available at brokerage offices frequently shows P/E ratios for recommended stocks.

Earnings are *not* the same as dividends. Dividends are paid out of earnings and are usually less per year.



Suppose, for instance, the P/E ratio is 16—1 (read sixteen to one). This means the price per share is sixteen times the annual earnings per share. A P/E ratio under 12—1 is considered low—the price of the stock is low compared to the earnings. A ratio of 25—1 is considered high—the price of the stock is high compared to the earnings. The normal range is from 13—1 to 24—1. The investor should keep in mind that the P/E ratio is only *one* measure of the quality of a stock.

To find the price/earnings ratio, divide the price per share of the stock by the annual earnings per share.

$$\text{P/E ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

EXAMPLE

Find the P/E ratio for Allied Chemical when the price per share is \$40 and the annual earnings per share are \$2.90.

Divide the price by the earnings.

$$\$40 \div \$2.90 = 13.8$$

- The P/E ratio is 13.8—1.

Discussion Question: What qualities of a stock should you study before buying it? What qualities would you want for a quick profit? For a long-term investment? Consider: Amount of dividend; annual yield; price/earnings ratio; stability of company; and so on.

EXERCISES Find the P/E ratio for these stocks.

ANNUAL EARNINGS				ANNUAL EARNINGS			
STOCK	PRICE	(PER SHARE)		STOCK	PRICE	(PER SHARE)	
1. Allied Stores	33 ³ / ₄	16.9—1	\$2.00	2. Borg-Warner	28 ¹ / ₂	8.0—1	\$3.55
3. Campbell Soup	32 ¹ / ₈	19.6—1	\$1.64	4. duPont	118 ¹ / ₂	21.0—1	\$5.63
5. Eversharp	28 ¹ / ₄	36.2—1	\$0.78	6. FMC Corp	26 ¹ / ₂	19.5—1	\$1.36
7. Goodyear	30 ⁷ / ₈	17.3—1	\$1.78	8. Holiday Inn	42 ⁵ / ₈	83.6—1	\$0.51
9. N.B. Fuels	55	27.8—1	\$1.98	10. Jones & Laughlin	22 ¹ / ₄	14.0—1	\$1.59
11. Kellogg	43	20.6—1	\$2.09	12. Loews Theaters	37 ³ / ₄	62.9—1	\$0.60
13. Masonite	65 ¹ / ₂	35.4—1	\$1.85	14. Nat Cash Reg	145 ¹ / ₂	121.3—1	\$1.20
15. Sask Edison	25 ³ / ₄	17.2—1	\$1.50	16. Pacific Gas & El	35 ⁵ / ₈	23.8—1	\$1.50

CHECKLIST

Asked price (p. 330)
 Bid price (p. 330)
 Board lot (p. 326)
 Broker (p. 326)
 Closing price (p. 324)
 Commission (p. 328)
 Dividend (p. 323)
 High price (p. 324)
 Listed stock (p. 330)
 Low price (p. 324)
 Net change (p. 324)
 Odd lot (p. 326)
 Organized stock exchange (p. 322)
 Points (p. 324)
 Price/earnings ratio (p. 333)
 Proceeds (p. 327)
 Share of stock (p. 322)
 Stockholder (p. 322)
 Stock quotations (p. 322)
 Unlisted stock (p. 330)
 Yield (p. 332)

PROBLEMS

In problems 1 through 12, find the total cost of buying the stock, including the odd lot fees and the commissions. The quoted prices are for board lots (100 shares). Use table 24.2 for computing commissions.

1. Clifford, who wants to invest for income, buys 50 shares of Northern Steel at 38½. **\$1956.57**
2. Shirley, who wants to speculate in hopes of making a big capital gain, buys 100 shares of Midnight Oil at 5¼. **\$589.37**
3. Herman, who wants to invest for long term growth, buys 5 shares of International Business Machines at 350½. **\$1782.51**
4. Henrietta, on the recommendation of her broker, buys 30 shares of Canadian Chain & Cable Company at 33¼. **\$1029.11**
5. Nicholas, on the basis of the strong financial posi-

tion of the company, buys 25 shares of Yukon Trust at 40½. **\$1019.57**

6. Lauretta, who inherited \$10 000 from her aunt, buys 200 shares of FMC Corporation at 25¼. **\$5139.97**
7. Louis, after diligent study of the airline industry, buys 45 shares of Northern Airlines at 37. **\$1692.31**
8. Eileen, who is employed by the Westinghouse Electric Company, buys 40 shares of Westinghouse stock at a price of 63⅞. **\$2596.90**
9. Oliver, at the suggestion of his father-in-law, buys 110 shares of Penn Dixie Cement at 19½. **\$2147.25**
10. Pamela, knowing the high mark-ups and high profits in the sale of cosmetics, buys 10 shares of Revlon at 101. **\$1026.56**
11. Avery buys 5 shares of Sears at 78½. **\$400.21**
12. Margaret buys 100 shares of the Book-of-the-Month Club at 23¼. **\$2418.66**

In problems 13 through 24, find the proceeds from the sale of the stock after deducting the odd lot fees and commissions. The prices quoted are for board lots. Use table 24.2 for computing commissions.

13. Kelvin, fearing a business recession and a drop in stock prices, sells 25 shares of Allied Stores at 33½. **\$823.75**
14. Teresina, who purchased Bell & Howell at 47⅞, sells 50 shares at 69 to take a profit. **\$3393.42**
15. Austin, whose father is hospitalized and in need of money, sells 35 shares of Dow Chemical at 75 to help him. **\$2581.95**
16. Rachel, whose father bought stock for her to help finance her college education, sells 75 shares of Maritime Oil at 68⅞. **\$5062.47**
17. Seymour, planning to switch stocks, sells 100 shares of American Motors at 12½. **\$1218.75**
18. Ida, who is planning a trip around the world, sells 100 shares of Scott Paper at 32½ to help pay for the trip. **\$3159.82**
19. Randolph, who has a "paper loss" on his Dr. Pepper stock, sells 42 shares at 15¼. **\$2122.36**
20. Babette, on the recommendation of her broker, sells 200 shares of Stokely Van Camp at 31. **\$6098.32**
21. Joel, who is buying a new car, sells 48 shares of Ottawa Cascade Corporation at 78¾, to pay for it. **\$3706.21**

22. Byron, on the basis of a reported decline in earnings, sells 135 shares of Boeing at $32\frac{7}{8}$. **\$4365.34**
23. Olga, anticipating a decline in price, sells 90 shares of Lockheed at $38\frac{5}{8}$. **\$3419.24**
24. Sabina, whose father is a stockbroker, acts on his advice and sells 25 shares of Milk Weed Dairy at $27\frac{1}{2}$. **\$675.76**

In problems 25 through 30, find the annual yield per share for the stocks.

25. Leo bought Chrysler at $42\frac{1}{2}$ and it pays \$2.00 per share dividend. **4.7%**
26. Fay receives \$1.20 dividend per share on her Caterpillar Tractor stock, which she bought at $43\frac{3}{8}$. **2.8%**
27. Winford received a quarterly dividend cheque of \$40 on his 100 shares of American Broadcasting stock which he purchased at $59\frac{3}{8}$. **2.7%**
28. Camilla bought 30 shares of Mobil Oil at $53\frac{3}{8}$. She receives a quarterly dividend cheque of \$6.60. **1.6%**
29. Maxwell receives \$0.25 quarterly per share on his **1.3%** Eastman Kodak stock. He paid $77\frac{1}{2}$ per share for it.
30. Angela bought 25 shares of New England Electric at $25\frac{1}{4}$. She receives a quarterly dividend of \$0.37 per share. **5.9%**

In problems 31 through 36, find either the price/earnings ratio or the price for the stock.

31. Paddy bought Quaker Oats at $62\frac{3}{8}$ when the per share earnings were \$1.78 and the dividend was \$1.40. **P/E=35.0-1**
32. Abigail bought Reynolds Metals at 35 when the dividend was \$0.90. The policy was to pay 50% of

the earnings in dividends. **P/E=19.4-1**

33. Ignatius acquired Collins Radio at $52\frac{3}{4}$ when the earnings per share were \$1.55. **P/E=34.0-1**
34. Columbia Gas earned \$1.75 per share and sold at a price/earnings ratio of 20 to 1. **\$35.00**
35. Clorox earned \$1.40 per share and sold at 15 times its earnings. **\$21.00**
36. Yukon Power sold at $50\frac{3}{8}$ when the dividend was \$1.52 and the earnings \$1.88. **P/E=26.8-1**

QUESTIONS

1. What is the function of the Vancouver Stock Exchange?
2. What is a board lot?
3. What is an odd lot?
4. Why are there additional charges for odd lot transactions?
5. How does an odd lot commission differ from a board lot commission?
6. How are prices quoted in the unlisted market?
7. Does a buyer pay a commission when purchasing a stock on the unlisted market?
8. Who declares dividends?
9. How are dividend yields computed?
10. What is the difference between dividends and earnings?
11. How are price/earning ratios computed?

Research/Discuss

- ☐ Because they are written promises to pay a certain sum of money at a future date with interest.
- ☐ Students should realize that bonds, like stock, are an investment. Thus you buy them from an investment broker. Some students may know that government bonds are sold through banks.
- ☐ Because they are preferred as to dividends, which

CHAPTER 25

means that dividends on them are paid from earnings before common stock dividends. Some preferred stocks also have a priority claim before common stocks on the corporate assets in the event the company is liquidated.

- ☐ As the name implies, fixed income is income that does not vary from payment to payment. With bonds and preferred stocks, the investment yield does not fluctuate with the company's earnings. That is, the dividends on preferred stocks and the interest on bonds are fixed—they do not change no matter how much money the company earns. Have students try to think of other income that is fixed, such as social security and salary. Then discuss some examples of income that is not fixed—commission, common stock dividends, and so on.

BONDS AND PREFERRED STOCKS

RESEARCH/DISCUSS

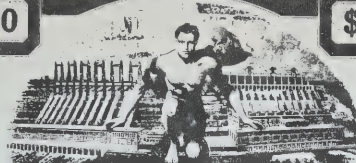
- ☐ Why are bonds like promissory notes?
- ☐ If you wanted to buy some bonds, where would you go?
- ☐ Why are preferred stocks given the name?
- ☐ What is “fixed income?” Are bonds and preferred stocks fixed income? What are some examples of income that is not fixed income?

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ how to read and interpret bond quotations
- ☐ how to compute bond yields
- ☐ how to compute the cost of a bond when it is sold between interest dates
- ☐ how to read preferred stock quotations
- ☐ why preferred stock is more like bonds than like common stock

\$1000

\$1000



THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

SH-K00000 5% BOND DUE 15TH JUNE 1983 SH-K00000

(SUBJECT TO PRIOR REDEMPTION)

AUTHORIZED ISSUE OF SIXTY-TWO MILLION DOLLARS (\$62,000,000) IN PRINCIPAL AMOUNT OF BONDS OF THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO, BEARING INTEREST AT THE RATE OF FIVE PER CENTUM (5%) PER ANNUM AND PAYABLE ON THE 15TH DAY OF JUNE 1983, SUBJECT TO PRIOR REDEMPTION, MADE UNDER THE AUTHORITY OF THE POWER COMMISSION ACT, R.S.O. 1960, CHAPTER 300 AND AMENDMENTS, AND OF AN ORDER OF THE LIEUTENANT-GOVERNOR IN COUNCIL.

GUARANTEED AS TO PRINCIPAL AND INTEREST BY THE PROVINCE OF ONTARIO.

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO (hereinafter called the "Commission") for value received hereby promises to pay to the bearer of it (captioned to the registered holder hereon on the 15th day of June 1983, or on such earlier date as this Bond may be redeemed in accordance with the provisions of redemption hereafter set forth, on presentation and surrender of this Bond, the sum of

ONE THOUSAND DOLLARS

in lawful money of Canada at any branch of any Chartered Bank in the Province of Ontario or in any of the Cities of St. John's, Halifax, Charlottetown, Saint John, Quebec, Montreal, Winnipeg, Regina, Calgary, Edmonton, Vancouver or Victoria, Canada, at holder's option, with interest thereon from the 15th day of June 1963 at the rate of Five per centum (5%) per annum payable half-yearly in like money or any of the said cities at holder's option on the 15th days of June and December in each year of the currency of this Bond on presentation and surrender of the interest coupons hereon attached as they severally become due.

The Commission shall have the right at its option to redeem the Bonds of this issue, either in whole or in part, in advance of maturity, on any interest payment date or on or after the 15th day of June 1979 at the stated rate and in the money in which the said Bonds are expressed to be payable, upon payment of the principal amount thereof together with interest accrued thereon to the date of redemption, and upon previous notice of such redemption by advertisement once in at least one City in each of the Provinces of Ontario and Quebec in a daily newspaper of general circulation published in such City, such notice to be advertised on or before the date fixed for redemption. In the event that the Bonds are to be redeemed shall be chosen by lot in such manner as the Commission may deem equitable, and for the purpose of redemption, each Bond of a denomination greater than \$1,000 may be deemed to consist of the appropriate number of units of \$1,000 each and any part of the principal amount of such Bond comprising one or more of such units may accordingly be selected and called for redemption. In the event of the selection for redemption of a unit only of the principal amount of any coupon Bond, payment of the redemption price of such portion will be made only upon surrender of such Bond with all unexpired interest coupons attached in exchange for a coupon Bond or Bonds of this issue for the unexpired balance of such principal amount, with all unexpired interest coupons attached. In the event of the selection for redemption of a portion only of the principal amount of any fully registered Bond, payment of the redemption price of such portion will be made only upon surrender of such Bond in exchange for a fully registered Bond or Bonds of this issue for the unexpired balance of such principal amount.

This Bond is subject to the Conditions endorsed hereon which form part hereof. This Bond is issued under the authority of The Power Commission Act, Revised Statutes of Ontario, 1960, Chapter 300 and amendments, and of an Order of the Lieutenant-Governor in Council.

IN WITNESS WHEREOF the Commission has caused its Corporate Seal and the engraved facsimile signature of its Chairman and a Vice-Chairman to be affixed hereto and this Bond to be duly signed by an Authorized Signing Officer of the Commission and to be dated the 15th day of June 1963.

GUARANTEE BY THE PROVINCE OF ONTARIO

BY virtue of the promise contained in this Bond to pay the principal of one thousand dollars to the bearer of it, the Province of Ontario has caused its Corporate Seal and the engraved facsimile signature of its Lieutenant-Governor in Council to be affixed hereto and this Bond to be duly signed by an Authorized Signing Officer of the Province of Ontario and to be dated the 15th day of June 1963.

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SPECIMEN

SPECIMEN

AUTHORIZED SIGNING OFFICER

Another way for a corporation to raise money is to issue bonds. One advantage of owning bonds rather than common stock, is that bond holders are creditors of the company while stockholders are owners. In the case of bankruptcy and liquidation, bondholders have a prior claim against the assets of the corporation. A bond is formal evidence that a corporation is indebted to the holder for a sum of money, which will be repaid at some future date, with interest at a stated rate. The purchaser of a bond receives a certificate like the one shown above.

○The Hydro-Electric Power Commission of Ontario issued this series of bonds in 1963. A

debenture is secured only by the reputation of the issuing company. Bonds may also be secured by real or personal property.

○If the registered owner holds the bond until maturity, June 15, 1983, they will receive \$1000 (referred to as the principal sum, face value, or par value).

○This paragraph not only says that the corporation will repay the principal sum, but that they will pay interest twice a year.

○The interest rate of 5% per annum is a nominal interest rate. The effective interest rate may be higher or lower than the nominal rate. (See page 184).

Discussion Question: How can a corporation raise money?

Consider: Issuing more stock; getting a loan from a bank; getting a loan from the general public (issuing corporate bonds).

The maturity date of a bond may be 25 years in the future, and the owner may not want to keep the bond that long. Consequently, bonds are bought and sold in much the same manner as stocks. Our Canadian Chartered Banks are prepared to assist investors in bond transactions, and each bank issues to all its branches current information of prices for selling and purchasing of bonds. The Investment Dealers Association of Canada also co-ordinate this information.

Bond prices are also listed in the financial pages of all Canadian newspapers. The following extracts are typical quotations. The "bid" is the selling price and the "ask" is the purchasing price of the bonds.

Corp. bonds

TORONTO (CPV) — Selected bond quotes as of Jan. 14 provided to the Investment Dealers Association of Canada by Wood Gundy Ltd., with yield on asking prices:

CORPORATIONS

		Bid	Ask	Yield
AltaBld 9 1/4	1 Apr 1990	90.00	92.00	10.74
AltaGs 9 1/4	15 Dec 90	92.50	92.50	10.20
Alg S11 10 1/4	15 Nov 94	94.75	97.00	10.74
Alcan 9 1/4	1 Jan 91	100.00	101.00	10.42
Bell 5 1/4	1 Oct 1984	76.50	78.50	9.10
Bell 6 1/4	15 Sept 1992	74.00	76.00	9.58
BC Forest 9 1/4	15 Dec 95	87.00	84.00	10.96
BC Tel 9 1/4	1 Oct 97	85.00	87.00	10.51
CPR 8 1/4	1 Feb 1992	90.00	91.00	9.85
Cominco 8 1/4	15 Apr 91	82.00	84.00	10.27
Con Gas 6 1/4	1 Feb 81	82.00	84.00	9.45
Con Gas 8 1/4	15 Oct 93	85.00	87.00	10.19
Dofasco 10 1/4	1 Jun 1994	98.00	99.00	10.12
Dominar 6 1/4	1 Apr 87	75.00	77.00	10.03
GMAC 7 3/4	30 Sept 86	75.00	75.00	10.73
HuskyO 8 1/4	15 Aug 91	80.00	82.00	10.66
HudB MS 9 1/4	15 Jun 91	87.00	89.00	10.41
Imp Oil 7 1/4	1 Jan 88	80.00	82.00	9.84
Ind Ac 6 1/4	15 Aug 84	73.00	75.00	10.99
Inco 8 1/4	30 Jun 91	85.00	87.00	10.28
Labatt 9 1/4	1 Sep 90	92.00	94.00	10.01
Loebaw 5 1/4	1 Nov 81	74.00	76.00	10.74
McVul 2 1/4	15 May 91	82.00	84.00	10.57
NRCen 9 1/4	15 Jan 91	87.00	88.00	11.40
Nr Elec 9 1/4	30 Apr 90	92.00	94.00	10.54
Sims 9 1/4	15 Dec 89	92.00	94.00	10.29
Stelco 9 1/4	1 Nov 90	91.00	93.00	10.15
TCPL 9 1/4	20 Sep 89	92.00	94.00	10.83
TCPL 9 1/4	20 March 91	85.00	87.00	10.70
Wstest T 8 1/4	15 May 91	79.00	81.00	10.44

CONVERTIBLES

Alta Gs 7 1/2	1 Feb 90	117.00	—	—
AshlandO 5 1/4	15 Jan 93	56.00	59.00	9.74
Beav L 5 1/4	1 May 89	65.00	—	—
Con Gas 5 1/4	1 Feb 89	70.00	72.00	9.07
Dorm Tx 5 1/4	12 Oct 92	70.00	73.00	8.78
Sims 4 1/4	15 Oct 88	102.00	—	—
Wstest T 7 1/2	1 Jan 91	90.00	92.00	8.42

Gov't bonds

CANADA AND GUARANTEED

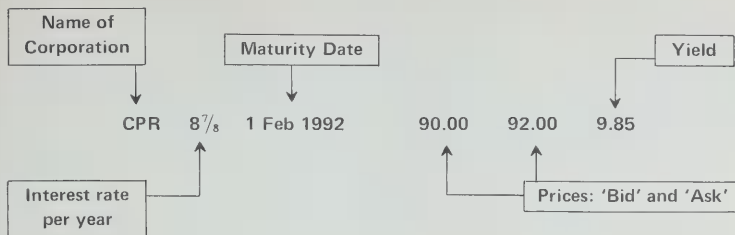
6 1/2	1 Apr 1975	99.90	100.00	6.39
7 1/4	July 1975	100.25	100.25	6.45
5 1/2	1 Oct 1975	99.25	99.25	6.44
7 1/4	15 Dec 1975	102.10	102.45	6.41
5 1/2	1 Apr 1976	99.15	99.25	6.15
3 1/4	1 Jun 1976	94.15	96.25	6.12
7 1/4	July 1977	101.90	102.10	6.07
7 1/4	Sept 1977	101.10	101.90	6.20
8 1/4	July 1978	104.75	105.15	6.29
5 1/2	1 Jun 1979	100.00	100.50	6.36
3 1/4	1 Oct 1979	86.75	87.25	6.43
5 1/4	15 Dec 1979	94.00	96.50	6.57
6 1/4	1 Apr 1980	95.00	96.50	6.57
5 1/2	1 Aug 1980	94.50	95.00	6.59
4 1/2	1 Sep 1983	83.40	83.75	7.04
5 1/4	June 1988	73.50	75.50	8.01
5 1/4	15 Feb 1989	86.00	88.00	8.21
5 1/4	1 May 1990	73.50	75.50	8.07
5 1/4	1 Sep 1992	75.00	77.00	8.25
5 1/4	1 Oct 1995	77.00	81.00	8.46
CNR 5 1/4	15 May 1977	84.85	87.10	6.35
CNR 5 1/4	1 Feb 1991	83.75	84.25	7.27
CNR 5 1/4	1 Jan 1993	84.50	84.50	7.72
CNR 5 1/4	1 Oct 1997	74.50	76.50	7.97

PROVINCIAL AND GUARANTEED

Alta 7 1/4	15 Oct 1989	83.13	87.13	9.15
Alta Tel 7 1/4	15 Dec 87	85.00	84.00	9.15
BC Hyd 5 1/4	1 Apr 77	94.00	95.00	8.25
BC Hyd 4 1/4	1 Aug 86	67.68	69.98	8.20
Man Hy 7 1/4	5 Apr 90	85.25	85.25	9.10
NS 7 1/4	1 Mar 1994	81.25	82.25	9.75
Nfld 10 1/4	1 Dec 1955	100.50	101.00	10.28
NS 7 1/4	1 Mar 89	79.50	80.50	9.45
Ontario 7 1/4	15 Feb 86	87.25	83.25	8.50
Ontario 7 1/4	15 Dec 91	81.00	82.00	9.16
Ontario 7 1/4	1 Dec 92	84.50	85.50	9.29
Ont Hyd 4 1/4	15 Jan 74	95.75	94.75	7.40
Ont Hyd 9 1/4	1 Apr 93	95.88	94.88	9.25
Ont Hyd 7 1/4	4 Feb 91	82.50	83.50	9.30
Ont Hy 7 1/4	15 Sep 91	83.75	86.75	9.50
Ont Hy 8 1/4	15 Sep 92	89.13	90.13	9.30
PEI 9 1/4	1 Nov 92	91.50	92.50	10.30
Que Hyd 9 1/2	1 Feb 75	99.50	—	—
Que Hyd 6 1/4	1 Oct 90	67.75	68.75	9.55
Sask 8 1/4	1 Dec 1987	94.50	—	—

Notice that the names of the corporations are abbreviated. For example, Wstest T stands for West Coast Transmission. Corporations can have more than one bond active at a time, as Ontario Hydro with five listed on this chart, and Canadian National Railways with four listed.

Look at the CPR entry:



This bond is described by the rate of interest it carries, the date of maturity. The entry 8 ⁷/₈ 1 February 1992 means that this bond pays 8 ⁷/₈ interest per year and the issue matures on February 1, 1992.

The selling price of the bond on the date of this reading was \$90 and the purchasing price was \$92. The yield calculated as earnings based on the purchasing price (asking) was \$9.85.

This advertisement is not to be construed as a public offering in any Province of Canada of the securities mentioned herein.

Additional Issue

\$40,000,000

MacMillan Bloedel Limited

11 1/4% Debentures Series G

To be dated January 28, 1975 To mature January 15, 1995

Price: 100 and accrued interest

The offering is made by the prospectus only, copies of which may be obtained from such of the undersigned and other dealers as may lawfully offer these securities in this Province.

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Wood Gundy Limited

Greenshields Incorporated

Dominion Securities Corporation
Harris & Partners Limited

Nesbitt Thomson Securities Limited

A. E. Ames & Co. Limited

Pitfield, Mackay, Ross & Company Limited

Richardson Securities of Canada

McLeod, Young, Weir & Company Limited

Merrill Lynch, Royal Securities Limited

Midland Doherty Limited

Pemberton Securities Limited

Odium Brown & T. B. Read Ltd.

Cochran Murray Limited

Fry Mills Spence Limited

Crang & Ostiguy Inc.

Lévesque, Reubien Inc.

Bell, Gouinlock & Company, Limited

René T. Leclerc Incorporated

C. M. Oliver & Company Limited

Bongard, Leslie & Co. Ltd.

J. T. Gendron Osler Inc.

Houston, Willoughby and Company Limited

Notices such as this often appear in the business sections of newspapers.

① MacMillan Bloedel Limited bonds are offered for purchase. The bonds are redeemable on January 15, 1995 and pay 11 1/4% nominal interest on the face value.

② The price of the bonds is 100% face value on January 28, 1975. If purchase takes place after the date of issue, then the price of the bonds will be increased by the amount of the accrued interest.

③ The prospectus is the official offering, and it supplies all the information about the bonds.

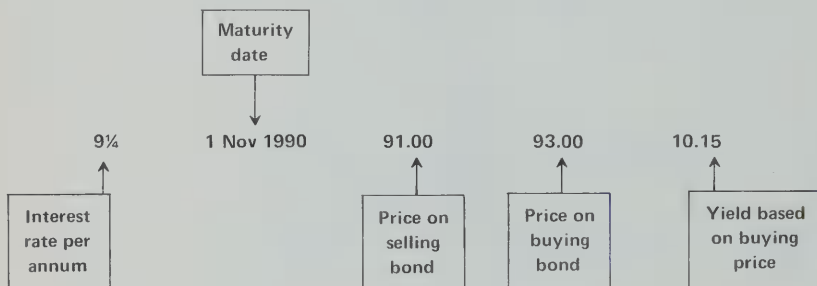
④ The companies listed here are the underwriters for the issue and from whom they are first offered for sale to the public.

25 b / BOND QUOTATIONS

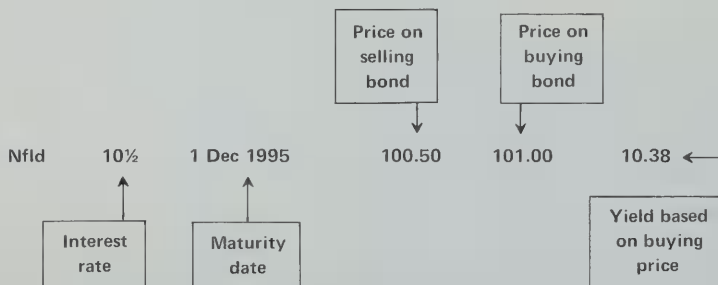
Point out that bonds, like stocks, can be purchased for speculation or investment. Emphasize, however, that the general principles for investing also apply to bonds. Safety of principal should always be the primary objective of an investor.

The prices of bonds are quoted in points. The points are percentage points of the face value of the bond (also called *par value*). A \$1000 bond that is quoted at 92¾ sells for 92¾% of \$1000 or \$927.50. Bond points are different from stock points since bond points are percents and stock points are dollars. A stock that is quoted at 92¾ sells for \$92.75.

Look at all of the first Stelco entry:



Consider also the Newfoundland Provincial Government Bond:



A bond can sell at below the face value or above the face value.

To find the price of a \$1000 bond, multiply the quoted percent (expressed as a decimal number) by the \$1000 par value.

EXAMPLE

From table 25.1, find the selling price of BC Hydro 4¾ 1 August 1986.

The quoted selling price is \$67.88. Multiply 67.88 by \$1000.

$$67.88 \times \$1000 = \$678.80$$

■ The selling price is \$678.80.

EXAMPLE

From table 25.1, find the price of selling 6 Alberta Telephone 7½ 15 Dec 1987 bonds which are in \$500 denominations.

The quoted selling price is 85.00. Multiply $85.00 \times \$500$.

$$85.00 \times \$500 = \$425.$$

The selling price for a \$500 bond is \$425.

Since 6 bonds are being sold, the total price is

$$6 \times \$425 = \$2550$$

- The price for the face value of \$3000 in Alberta Telephone bonds sells at the quotation for \$2550.

EXAMPLE

You are now buying Prince Edward Island Provincial Government Bonds. (PEI 9¼ 1 Nov 1990)

The purchasing price is quoted at 92.50.

To buy 2 bonds of \$1000 each denomination

$$92.50 \times \$1000 = \$925$$

- The price for each \$1000 bond is \$925.
- The purchase price of 2 bonds will be $2 \times \$925 = \1850 .

EXERCISES Find the required bond prices from table 25.1.

BONDS	AMOUNT	TRANSACTION	
1. CNR 5¾ 1 Jan 1985	\$ 10 000	buying	\$8650.00
2. Imp Oil 7¾ 8 Jan 1988	\$ 9500	selling	\$7600.00
3. TCPL 9¾ 20 Sept 1990	\$ 6000	selling	\$5520.00
4. BC Hydro 4¾ 1 Aug 1986	\$ 4500	buying	\$3144.60
5. Nr Elec 9¾ 30 Apr 1990	\$ 6500	buying	\$6110.00
6. McMil 8½ 15 May 1991	\$ 7000	buying	\$5740.00
7. Ontario 7 15 Feb 1986	\$ 16 000	selling	\$13 960.00
8. Sask 8¾ 1 Dec 1989	\$ 20 000	selling	\$18 900.00
9. Labatt 9¾ 1 Sept 1980	\$ 17 000	buying	\$1598.00
10. Wstct T 8 15 May 1991	\$ 26 000	buying	\$2106.00
11. Cominco 8½ 15 Apr 1991	\$ 9000	selling	\$7380.00
12. Ind Ac 6¾ 15 Aug 1984	\$ 6000	buying	\$4500.00
13. Bell 6¾ 15 Sept 1992	\$ 11 000	buying	\$8360.00
14. Con Gas 8¾ 8 15 Oct 1993	\$ 6000	selling	\$5100.00
15. Man Hyd 7¾ 8 5 Apr 1990	\$ 13 000	selling	\$11 082.50
16. N.B. 7¾ 1 Mar 1994	\$ 26 000	selling	\$21 125.00

25 C / BOND YIELDS

Mention that bond yields, like stock yields are used as a measuring device to compare investments. Point out that it is not the only measuring device, however. Discuss other factors that should be considered before purchasing a bond.

Since bonds are purchased as investments, the buyer is interested in knowing what kind of a return he will get on a bond purchase. That is, he wants to know what kind of interest he will get.

If a \$1000 bond is purchased at 100%, the actual rate of interest earned on a bond purchase will vary with the price paid for the bond. A bond is selling at a *premium* if it is purchased at more than 100%. A bond is selling at a *discount* if it is purchased at less than 100%.

The rate of interest that a bond carries as its contractual rate is called the *nominal rate*. The rate of interest that a bond actually earns is called the *effective rate*. The effective rate depends on the price paid for the bond. When a bond sells at a discount (less than 100%), the effective rate is higher than the nominal rate. This is because interest is received on \$1000 even though less than \$1000 is invested. When a bond sells at a premium (more than 100%), the effective rate is lower than the nominal rate. In this case, interest is received on \$1000 even though more than \$1000 is invested.



Effective rate = nominal rate *only* if the bond sells at par (100%).

To find the effective rate of interest for a bond investment, divide the annual interest, expressed in dollars, by the cost of the bond, expressed in dollars.

$$\frac{\text{Annual interest (\$)}}{\text{Actual cost (\$)}} = \text{Effective rate}$$

EXAMPLE

Find the effective rate on Can Corp 2¾ 1980, if it sells at 76¼.

Find the price of the bond.

$$76\frac{1}{4}\% = 0.7625$$

$$\$1000 \times 0.7625 = \$762.50$$

Compute the annual interest income

$$\begin{aligned} 2\frac{3}{4}\% \text{ of } \$1000 &= 0.0275 \times \$1000 \\ &= \$27.50 \end{aligned}$$

Divide the interest by the price of the bond.

$$\$27.50 \div \$762.50 = 0.036 = 3.6\%$$

- The effective rate is 3.6%.

EXAMPLE

Find the effective rate on Arctic Pet 8 1984, if it sells at 101¼.

Find the price of the bond.

$$101\frac{1}{4}\% = 1.0125$$

$$\$1000 \times 1.0125 = \$1012.50$$

Compute the annual interest income.

$$\begin{aligned} 8\% \text{ of } \$1000 &= 0.08 \times \$1000 \\ &= \$80.00 \end{aligned}$$

Divide the interest by the price of the bond.

$$\$80.00 \div \$1012.50 = 0.079 = 7.9\%$$

- The effective rate is 7.9%.

Project: Investigate the different types of bonds available. Compare the rates of return for each. Compare the rate of return for bonds with rates for savings accounts.

- Nominal interest is computed on the par value, *not* on the price paid.
- Effective interest is computed on the price paid for bond.



EXERCISES Find the effective rates on these bonds. Refer to table 25.1 for quotations. The purchase of “bid” price will be used in your calculations.

1. Abitibi	9¾	1 Apr 1990	10.83%
2. Husky	8½	15 Aug 1991	10.62%
3. Labatt	9¼	1 Sep 1990	10.05%
4. Sims	9½	15 Dec 1989	10.33%
5. NR Cen	9 ⁵ / ₈	15 Jan 1991	11.06%
6. Dofasco	10	1 Jun 1994	10.2%
7. Man Hyd	7 ⁷ / ₈	5 Apr 1990	9.23%
8. Ontario	7	15 Feb 1986	8.02%
9. PEI	9¼	1 Nov 1990	10.14%
10. Que Hyd	6	1 Oct 1990	8.86%
11. Alta	7 ⁷ / ₈	15 Oct 1989	8.94%
12. GMAC	7	30 Sep 1986	9.59%
13. McMil	8½	15 May 1991	10.37%
14. CPR	8 ⁷ / ₈	1 Feb 1992	9.86%
15. Nr Elec	9¾	30 Apr 1990	11.20%
16. Domtar	6¾	1 Apr 1987	9.0%

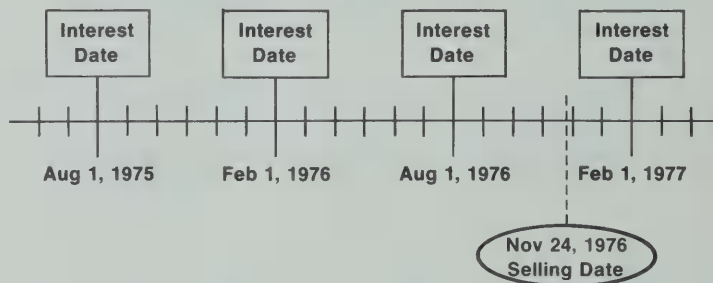
25 d / PURCHASES BETWEEN INTEREST DATES

The interest on bonds is usually paid semi-annually—every six months the bondholder receives one-half of the annual interest. When a bond is traded between two interest dates, interest has accumulated that the bondholder has not yet received. Therefore, the buyer must pay both the cost of the bond and all the interest that has accumulated from the date of the last payment to the date of the sale. This accumulated interest is called *accrued interest*.

Project: Find out what convertible bonds are and what advantages they have, if any.

EXAMPLE

A Canadian Railroad 6% bond is due in the year 2000. The interest is payable on February 1 and August 1. Find the cost plus accrued interest if it is sold at $84\frac{1}{2}$ on November 29.



Find the cost of the bond.

$$84\frac{1}{2}\% = 0.845$$

$$0.845 \times \$1000 = \$845$$

Find the accrued interest from August 1 to November 29.

$$I = P \times R \times T$$

$$P = \text{principal} = \$1000$$

$$R = \text{rate of interest} = 6\%$$

$$T = \text{time in years} = \frac{120}{365}$$

- Use table 13.1 to find the number of days between August 1 and November 29.
- Change the days to years, using the ordinary year.

$$\begin{aligned} I &= \$1000 \times \frac{6}{100} \times \frac{120}{365} \\ &= \$19.73 \end{aligned}$$

Note that the ordinary year is used in computing accrued interest.

Add.

$$\$845.00 + \$19.73 = \$864.73$$

- The total cost of the bond is \$864.73.

Accrued interest will always be less than the regular semi-annual payment.

Remind students that the time involved is from the last payment date to the sale date—not from the sale date to the next interest date.



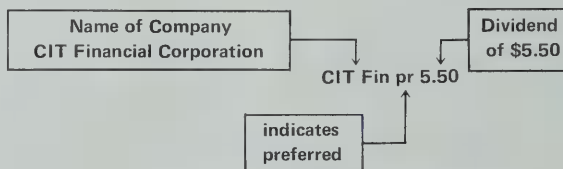
EXERCISES Find the cost plus accrued interest for these \$1000 bond transactions.

BOND	PRICE	INTEREST DATES	SALE DATE
1. Alcoa 6 1992 \$863.45	86	March 15	April 5
2. Beth Steel 4½ 1990 \$716.27	70	September 15	
3. Col Gas 4¾ 1981 \$730.10	72½	July 1	November 10
4. Det Ed 6 1996 \$867.26	86¼	January 1	
5. Fam Fin 9½ 1989 \$1048.32	102¾	April 1	June 8
6. GAC Cp 5⅞ 1994 \$1314.80	130	October 1	
7. Hunt Fds 4¾ 1986 \$1710.67	170	October 1	June 30
8. Ill Bell Tel 2¾ 1981 \$635.20	63	June 1	
9. Jones Lau 6¾ 1994 \$815.51	78½	December 1	December 3
10. Kerr McG 3¾ 1992 \$795.82	78¾	September 5	
11. Litton 3½ 1987 \$1414.90	140	March 5	January 25
12. McDonald 4¼ 1993 \$1256.64	124½	October 15	
13. Nor Pac 4 1997 \$609.64	60	April 15	December 29
14. Okla GE 2¾ 1979 \$775.76	76¼	October 1	
15. Penney JC 5¾ 1987 \$788.69	78	January 15	March 25
16. Quebec Nat Gas 5¾ 1985 \$722.65	70½	July 15	
		April 1	September 13
		October 1	
		May 1	July 21
		November 1	
		April 1	September 4
		October 1	
		February 1	May 12
		August 1	
		January 1	March 30
		July 1	
		February 1	July 27
		August 1	
		February 1	April 1
		August 1	
		April 1	August 15
		October 1	

25 e / PREFERRED STOCKS

Preferred stocks, like common stocks, represent ownership of a corporation. However, the preferred stockholders have a prior claim over the common stockholders in the distribution of earnings (dividends). That is, they will receive dividends before common stockholders. Also, many preferred stocks give the holder priority in claiming assets if the corporation is dissolved. The dividends on preferred stocks are usually set at a fixed rate of percent of the par value. When a corporation declares a dividend, the preferred stockholder will receive this fixed amount, no more nor less. Therefore, preferred stocks are considered “fixed income” investments, just as bonds are.

Preferred stocks are usually differentiated from common stocks by the letters “pr” following the stock name in the listings. For example,



Most preferred stocks are issued in \$100 par value shares. Thus, the \$5.50 dividend of the CIT preferred stock represents a dividend of 5½% of the par value.

$$\begin{aligned}\text{Dividend rate} &= \frac{\text{Amount of dividend}}{\text{Par value}} \\ &= \frac{\$5.50}{\$100.00} = 5.5 = 5\frac{1}{2}\%\end{aligned}$$

143%	113%	ADuVt pf.84a	123%	123%	123%	123%	1/6	482/2	331/2	CinMilac	4.10	32	422/2	422/2	422/2	423%	- 5/6	
323%	254%	A E1Pw 1.70a	399	303%	31	301%	307+	504	403%	CIT Finl 2	29	50	491%	493%	- 3/4			
143%	41%	Am Exp Ind	193	71%	71%	65%	7	1251/4	100	CIT prf5.50B	2	1231/4	1231/4	1231/4	1231/4	- 1/3		
62%	20%	Am Exp pf	x1520	31	321/2	31	32	+ 134%	49%	39%	CitySvcSw	2.20	245	45%	464%	45%	461+1/2	
231/4	16%	Am Fin 1.10	18	19	18%	18%	36	- 3/4	25%	14%	City Invt	5.29	239	20%	195%	205%	+ 1/4	
211/2	17%	AmFin prf1.50	250	187%	187%	187%	+ 1/4	13%	7%	City Inv w	57	9%	9%	9%	9%			
28	247%	A GenBd .16e	127	271/2	271/2	271/2	+ 1/4	13%	30	City prf B2	137	36	361/4	35%	36%			
25	16	A GenIns .50	268	211/2	21	21	- 3/4	11%	7	City prf	51	81%	81%	81%	81%			
35%	273%	A Gnin prf1.80	32	33	331/2	33	336+	+	24%	36	Clark E	1.40	35	463/4	461%	461%		
141/2	87%	Am Holst .40	37	11%	111/4	111/4	- 1/2	49%	14%	Clark Oil	4.40	273	174%	18%	181	+ 1/4		
94	70	A Home 1.70	167	39%	87%	86%	87	- 3/4	791/2	553%	Clav Cliff	1.20	22	671/2	671/2	661/2		
43%	30%	Am Inspr .26	179	37%	40%	39%	40	+ 1/4	42%	331/4	EleV Clint	2.28	59	38	381/4	381/4	+ 1/4	
197%	9	AmInsvl .50g	16	121/4	123%	121%	121%	+ 1/2	103	102	Clav El II prf	2000	1021/2	1021/2	1021/2	1021/2	- 1/2	
38	235%	A Medical .12	96	351/4	361%	351%	361%	+ 1/2	18	101%	Clav Pitts	2180	16	161/2	16	161/2	+ 1/4	
38	231/4	A MedCor	195	181/2	183%	181%	183%	+ 1/2	61%	33%	Clorox J	86	59%	59%	59	59	- 1/2	
373%	251/4	A MiClx 1.40	333	29	28%	29	+ 1/8	27%	17%	CluettPee	90	176	231/2	231/2	231/4	231/4	- 1/4	
1067%	79	AMClx prf.25	2	851/2	857%	851/2	857+	1/2	204	14%	CluettP pr f 1	6	171/4	171/4	171/4	171/4	+ 1/4	
9	57%	Am Motors	1026	8	8 1/4	8	8 1/4	+ 1/8	26%	171/2	CNA Finl.50	424	26%	26%	25%	25%	- 1/4	
431/4	34%	ANASGas 2.20	x126	391/4	397%	391%	391+	+ 1/4	34	41%	Coat pr A1.10	24	33%	34%	33%	33%	- 1/4	
661%	411/4	A ResDv .18g	47	551/2	551%	54%	55	- 3/4	56%	431/4	Coast St Gas	121	50%	51	49%	50%		
21%	163%	Am Seaf .72	16	191/2	19%	191/2	19+	3/4	62%	43%	CGS pr 1.93	177	53%	53	52	52	- 1/4	
401/2	24	Am Ship .60	28	381/2	38%	381/2	381/2	- 1/8	124%	81%	CocaCol	111	111	111	111	111	+ 1/4	
28%	16%	ASmElfr 1.20	185	211/2	211/2	211/2	- 1/8	49	25%	Coata Btlg	66	237	49	50	49	493+		
531/4	31%	AmSofr .70	7	381/4	391%	381/4	39	+ 1	26%	20	Coldwl Bnr	25	24%	25	24%	241/2		
321/4	12	Am Stand .40	393	141/4	141/2	137%	14	- 1/4	61%	43%	Colg Pal	1.46	120	60	601/4	59%	60	+ 1/4
81	56	A Std pf4.75	115	62%	62%	60%	60%	- 1/4	61	50	Colg P prf3.50	230	54	54	54	54	- 1/2	



Project: Find out what priorities preferred stocks have over common stocks. Investigate cumulative and participating preferred stocks. Why do preferred stocks resemble bonds more closely than common stocks in investment characteristics?

Since preferred stocks are “fixed income” investments, the investor is not only interested in the dividends paid on the stock. He also wants to know the effective return on his investment. The effective yield on preferred stock is found by dividing the dividend by the price paid for the stock.

$$\text{Effective yield} = \frac{\text{Dividend}}{\text{Price paid for stock}}$$

If the stock is bought at par value, the effective yield is the dividend rate.



EXAMPLE

Find the effective yield on Colgate pr 3.50 when the price is 59.

Divide the dividend by the price per share.

$$\begin{aligned} \$3.50 \div \$59.00 &= \$0.0593 \\ &= 5.9\% \end{aligned}$$

- The effective yield is 5.9%.

EXERCISES Find the effective yield.

PREFERRED STOCK	PRICE	PREFERRED STOCK	PRICE	PREFERRED STOCK	PRICE
1. Air Pd pr 4.75	110 4.3%	2. Alleg Lud pr 3	45¾ 6.6%	3. Allied St pr 4	58½ 6.8%
4. Ame H pr 3.50	85¼ 4.1%	5. Am Std pr 3.50	100¼ 3.5%	6. Am Sug pr .68	9⅝ 7.1%
7. AMK pr 3.20	111 2.9%	8. Arm Ck pr 3.75	58⅞ 6.5%	9. Atl CE pr 5.87	101 5.8%
10. Atl Rch pr 2.80	66 4.2%	11. Beat Fds pr 4	100 3.0%	12. Benif Fin pr 4.50	61 7.4%
13. Brist My pr 4.50	46¾ 9.6%	14. Budd Co pr 5	64 7.0%	15. Bunk R pr 1.50	43½ 3.4%

REVIEW / BONDS AND PREFERRED STOCK

CHECKLIST

Accrued interest (p. 344)
Annual interest (p. 339)
Bond (p. 338)
Bond price (p. 340)
Bond quotation (p. 338)
Bond yield (p. 342)
Current value (p. 338)
Discount (p. 342)
Dividend (p. 346)
Effective rate (p. 342)
Effective yield (p. 347)
Face value (p. 340)
Interest date (p. 344)
Interest rate (p. 339)
Issue (p. 339)
Maturity date (p. 339)
Nominal rate (p. 342)
Par value (p. 340)
Percentage points (p. 340)
Preferred stock (p. 346)
Premium (p. 342)
Sale Date (p. 345)

PROBLEMS

In problems 1 through 6, interpret the bond quotations. Give the nominal rate of interest, the amount of each semi-annual interest payment for a \$1000 bond, the price of the bond in dollars, and the year of maturity.

1. Bruno purchased Moncton Gas & Electric 5 1990 at $69\frac{3}{8}$. **5.0%; \$25.00; \$693.75; 1990**
2. Madeline purchased Food Machinery & Chemical 3.80 1981 at $72\frac{1}{4}$. **3.8%; \$19.00; \$722.50; 1981**
3. Bryan purchased Alberta Utilities $4\frac{1}{2}$ 1987 at 68. **4.5%; \$22.50; \$680.00; 1987**
4. Nina purchased Pacific Southwest Airlines 6 1987 at 71%. **6.0%; \$30.00; \$717.50; 1987**
5. Dan purchased Saskatchewan Power $5\frac{1}{8}$ 1996 at $69\frac{1}{2}$. **5.125%; \$25.63; \$695.00; 1996**

6. Willa purchased National Biscuit $4\frac{3}{4}$ 1987 at $75\frac{1}{8}$. **4.75%; \$23.75; \$751.25; 1987**

In problems 7 through 12, find the effective rate to the nearest tenth of a percent. Use your answers to problems 1 through 6.

7. Moncton Gas & Electric 5 1990 purchased at $69\frac{3}{8}$. **7.2%**
8. Food Machinery & Chemical 3.80 1981 purchased at $72\frac{1}{4}$. **5.3%**
9. Alberta Utilities $4\frac{1}{2}$ 1987 purchased at 68. **6.6%**
10. Pacific Southwest Airlines 6 1987 purchased at 71%. **8.4%**
11. Saskatchewan Power $5\frac{1}{8}$ 1996 purchased at $69\frac{1}{2}$. **7.4%**
12. National Biscuit $4\frac{3}{4}$ 1987 purchased at $75\frac{1}{8}$. **6.3%**

In problems 13 through 24, find the cost plus accrued interest for the \$1000 bond transactions.

13. Gus purchased Lethbridge Power & Light $4\frac{3}{8}$ 1993 at 65% on June 3. The interest payment dates are February 1 and August 1. **\$672.12**
14. Ben purchased National Steel Corporation $6\frac{7}{8}$ 1999 at $96\frac{1}{4}$ on May 12. The last interest payment was made on March 1. **\$976.06**
15. Cal purchased Alberta Telephone $7\frac{3}{4}$ 1999 at 96% on April 10. The interest payment dates are January 1 and July 1. **\$986.00**
16. Bridget purchased Great Lakes Steamship 5 1982 at $58\frac{7}{8}$ on June 1. The last payment date for interest was March 1. **\$601.35**
17. Fay purchased Columbia Gas System $6\frac{5}{8}$ 1992 at $88\frac{7}{8}$ on August 3. The last interest payment date was April 1. **\$911.42**
18. Sibyl purchased Container Corporation of Canada 3.30 1980 at 71 on May 2. The interest dates are January 1 and July 1. **\$720.93**
19. Dawn purchased Berkey Photo $5\frac{3}{4}$ 1986 at 103 on July 10. The last interest date was March 1. **\$1050.60**
20. Kathryn purchased Chadbourn Inc. $6\frac{1}{2}$ 1989 at $108\frac{1}{4}$ on April 25. The last interest date was March 1. **\$1092.29**
21. Nadine purchased Gibraltar Financial $4\frac{1}{2}$ 1976 at $116\frac{1}{2}$ on August 5. The interest dates are June 1 and December 1. **\$1173.01**

22. Leander purchased Lucky Stores 5 1993 at 126½ on June 25. The last interest date was April 1. **\$1276.78**
23. Jack purchased McCrory 6½ 1992 at 113 on June 20. The interest payment dates are February 1 and August 1. **\$1154.75**
24. Leslie purchased Pan Am World Airways 4½ 1984 at 118⅞ on September 28. The last interest date was July 15. **\$1190.50**

In problems 25 through 32, compute the effective yield on the preferred stocks at the purchase price given.

25. Abel purchased Jones & Laughlin pr 5 at 66½. **7.5%**
26. Elaine purchased Mead Corporation pr 2.80 at 48. **5.8%**
27. Oscar purchased Occidental pr 4 at 77½. **5.2%**
28. Carla purchased Pet Incorporated pr 1 at 19¼. **5.2%**
29. Elbert purchased RCA pr 4 at 92½. **4.3%**
30. Hal purchased Schenly pr 0.50 at 8⅞. **6.2%**
31. Bayard purchased Brands pr 3.50 at 55¼. **6.3%**

32. Ada purchased Tri-Continental pr 2.50 at 35⅜. **7.1%**

QUESTIONS

1. What is a bond?
2. What is the nominal rate of interest for a bond?
3. What is the effective rate of interest for a bond?
4. Why do corporations sell bonds?
5. Why do investors buy bonds?
6. How is the interest rate affected when bonds sell at a discount?
7. How is the interest rate affected when bonds sell at a premium?
8. Under what conditions does the nominal rate of interest equal the effective rate of interest?
9. How do bond quotations differ from stock quotations?
10. How do you find the yield on preferred stocks?
11. What do bonds and preferred stocks have in common as investments?

CANADA SAVINGS BONDS

Canada Savings Bonds are the most popular investment of Canadians. Each year, the C.S.B. Sales Campaign urges the purchase of "The Bonds" from all chartered banks or through payroll deduction programs.

The widespread acceptance of the annual campaign is evident in that 676 000 Canadians purchased bonds through payroll deduction plans. In the 1972 campaign, more than 5000 companies offered the payroll savings plan. The 1974-75 series had an estimated budget of \$1 000 000 for an all-media and direct-mail campaign, and from this campaign our Federal Government raised a net total of \$2 550 000 000 through the sale of bonds.

C.S.B. CURRENT HOLDINGS

More than \$9 000 000 000 of Canada Savings Bonds were held by Canadians on March 31, 1974. The 1974 issue was the twenty-ninth in the series of campaigns. Bonds still held from earlier issues are, as examples,

Date of Issue	Amount Outstanding	Rate of Interest
1967	93 362 150	5¼%
1969	3 906 753 950	8%
1970	1 455 768 950	7¾%
1971	1 610 373 550	5¾%
1973	1 044 700 000	
1974	over 2 550 000 000 were sold	

Is there a relation between the number held and the rate of interest? Why did the interest rate vary so much over these few sample years? Do you know what rate of interest was quoted on the most recent issue?

SOME INTERESTING FACTS

Canada once, but only once, issued a bond with no maturity date. A 1936 issue of bonds bearing interest at 3% per annum sold to a total of \$55 000 000. The year was one of deep economic depression and to investors it seemed desirable to have money safe with the government, at a 3% earning, and with the special feature of never being faced with a termination of this agreement at a maturity!

Thirty-nine years later, realized now as a least-desirable investment, these bonds were traded for as little as \$38 for a \$100 bond.

A 1975 decision by the Government of Canada established a maturity date of September 15, 1996. They will, therefore, now trade on a yield basis comparable with other Canadian bonds.

* * * * *

Many Canadians can still remember the smallest "bond" they ever purchased. They sold for twenty-five cents!

To encourage very young people to save and participate in the war financing program for the Second World War (1939-1945), war saving stamps were sold to school students. When stamps to a value of \$4.00 had been purchased and placed on a special collection form, they could then be exchanged for a War Saving Certificate which at maturity was worth \$5.00.

To many, the smallest bond purchased was the "twenty-five cent stamp", and the bond saving habit commenced at school!

* * * * *

Can a Canadian Bond be "Inflation-Proof"?

A bond has the feature of a guaranteed principal value. Many investors purchase bonds as security for their retirement income in the expectation that the \$1000 saved now will still buy at least \$1000 worth of goods and services at maturity. Inflation, however, can seriously erode that purchasing power.

Is there any way in which the value of a savings bonds could be tied to the cost-of-living in order to protect those who buy for retirement security?

— \$ 500 —

S27 B0319398

Canada Savings Bond
1972/73 SERIES
MATURING
November 1, 1984

CANADA

THE GOVERNMENT OF CANADA for value received will pay to the registered owner hereof the sum of
FIVE HUNDRED DOLLARS

on November 1, 1984, or at the registered owner's option on demand, upon presentation of this bond, and will pay interest thereon at the rate of 11% in each year, or the rate of interest then in force, appearing on the reverse hereof, and will also pay the compound interest certificates, and coupons, and interest coupons and certificates as specified in the schedule.

If this bond is redeemed prior to maturity the amount payable shall include accrued interest for each full month which has elapsed since the date of the last matured coupon, or since the date of the bond if redeemed before the first coupon has matured. A table of redemption values is shown on the reverse hereof.

PRINCIPAL AND INTEREST ARE PAYABLE WITHOUT CHARGE AT ANY BRANCH OF ANY BANK IN CANADA IN LAWFUL MONEY OF CANADA.

This bond is one of an issue of bonds of Canada authorized by Act of the Parliament of Canada, issued on or to be issued on date the first day of November 1972 and maturing the first day of November 1984.

This bond is subject to the conditions set out on the reverse hereof.

DATED AT OTTAWA November 1, 1972.

COUNTERSIGNED
CONTRASIGNÉ

OF THE BANK OF CANADA, FISCAL AGENT OF THE GOVERNMENT OF CANADA
DE LA BANQUE DU CANADA, AGENT FINANCIER DU GOUVERNEMENT DU CANADA

PARTICULARS OF REGISTRATION
DÉTAILS DE L'IMMATRICULATION

NAME OF REGISTERED OWNER
NOM DU PROPRIÉTAIRE IMMATRICULÉ

OFFICIAL STAMP OF ISSUING AGENT
TIMBRE OFFICIEL DE L'AGENT ÉMETTEUR

THE TORONTO-DOMINION BANK
4799 Yonge St. & Sheppard Ave. 1976
WILLOWDALE, ONTARIO

DATE

— \$ 500 —

S27 B0319398

Obligation d'Épargne du Canada
ÉMISSION 1972/73
ÉCHEANT
le 1er novembre 1984

CANADA

Le présent document est un bon de placement qui, à la date de son émission, a été affecté à l'achat de biens et de services. Il est émis en vertu de la loi du 1er novembre 1972 et sera remboursé le 1er novembre 1984, ou à la demande du titulaire, sur présentation de ce bon de placement, le 1er novembre 1984, ou au gré du propriétaire immatriculé qui demandera le somme de
CINQ CENT DOLLARS

Le présent document est un bon de placement qui, à la date de son émission, a été affecté à l'achat de biens et de services. Il est émis en vertu de la loi du 1er novembre 1972 et sera remboursé le 1er novembre 1984, ou à la demande du titulaire, sur présentation de ce bon de placement, le 1er novembre 1984, ou au gré du propriétaire immatriculé qui demandera le somme de
CINQ CENT DOLLARS

Si la présente obligation est remboursée avant l'échéance, le montant payable comprendra l'intérêt couru pour chaque mois complet écoulé depuis la date du dernier coupon échu, ou depuis la date de l'émission si elle est remboursée avant l'échéance du premier coupon. Un tableau des valeurs de remboursement apparaît au verso.

Le principal et l'intérêt sont payables sans frais, en monnaie légale du Canada, à toute succursale de banque au Canada.

Le présent document fait partie d'une émission d'obligations en Canada autorisée par une loi du Parlement du Canada, émise ou à émettre en date du premier novembre 1972 et échéant le premier novembre 1984.

La présente obligation est assujettie aux conditions inscrites au verso.

OTTAWA, le 1er novembre 1972.

DEPUTY MINISTER OF FINANCES
SOUS-MINISTRE DES FINANCES

APPLICATION FOR REDEMPTION
DEMANDE DE REMBOURSEMENT

DATE

SIGNATURE OF REGISTERED OWNER
SIGNATURE DU PROPRIÉTAIRE IMMATRICULÉ

PAID STAMP OF REDEMPTION AGENT
TIMBRE DE L'AGENT DE REMBOURSEMENT

IDENTIFICATION

— \$ 500 —

S27 B0319398

Canada Savings Bond
1972/73 SERIES
MATURING
November 1, 1984

CANADA

THE GOVERNMENT OF CANADA for value received will pay to the registered owner hereof the sum of
FIVE HUNDRED DOLLARS

on November 1, 1984, or at the registered owner's option on demand, upon presentation of this bond, and will pay interest thereon at the rate of 11% in each year, or the rate of interest then in force, appearing on the reverse hereof, and will also pay the compound interest certificates, and coupons, and interest coupons and certificates as specified in the schedule.

If this bond is redeemed prior to maturity the amount payable shall include accrued interest for each full month which has elapsed since the date of the last matured coupon, or since the date of the bond if redeemed before the first coupon has matured. A table of redemption values is shown on the reverse hereof.

PRINCIPAL AND INTEREST ARE PAYABLE WITHOUT CHARGE AT ANY BRANCH OF ANY BANK IN CANADA IN LAWFUL MONEY OF CANADA.

This bond is one of an issue of bonds of Canada authorized by Act of the Parliament of Canada, issued on or to be issued on date the first day of November 1972 and maturing the first day of November 1984.

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DATED AT OTTAWA November 1, 1972.

COUNTERSIGNED
CONTRASIGNÉ

OF THE BANK OF CANADA, FISCAL AGENT OF THE GOVERNMENT OF CANADA
DE LA BANQUE DU CANADA, AGENT FINANCIER DU GOUVERNEMENT DU CANADA

PARTICULARS OF REGISTRATION
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NAME OF REGISTERED OWNER
NOM DU PROPRIÉTAIRE IMMATRICULÉ

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DATE

— \$ 500 —

S27 B0319398

Obligation d'Épargne du Canada
ÉMISSION 1972/73
ÉCHEANT
le 1er novembre 1984

CANADA

Le présent document est un bon de placement qui, à la date de son émission, a été affecté à l'achat de biens et de services. Il est émis en vertu de la loi du 1er novembre 1972 et sera remboursé le 1er novembre 1984, ou à la demande du titulaire, sur présentation de ce bon de placement, le 1er novembre 1984, ou au gré du propriétaire immatriculé qui demandera le somme de
CINQ CENT DOLLARS

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CINQ CENT DOLLARS

Si la présente obligation est remboursée avant l'échéance, le montant payable comprendra l'intérêt couru pour chaque mois complet écoulé depuis la date du dernier coupon échu, ou depuis la date de l'émission si elle est remboursée avant l'échéance du premier coupon. Un tableau des valeurs de remboursement apparaît au verso.

Le principal et l'intérêt sont payables sans frais, en monnaie légale du Canada, à toute succursale de banque au Canada.

Le présent document fait partie d'une émission d'obligations en Canada autorisée par une loi du Parlement du Canada, émise ou à émettre en date du premier novembre 1972 et échéant le premier novembre 1984.

La présente obligation est assujettie aux conditions inscrites au verso.

OTTAWA, le 1er novembre 1972.

DEPUTY MINISTER OF FINANCES
SOUS-MINISTRE DES FINANCES

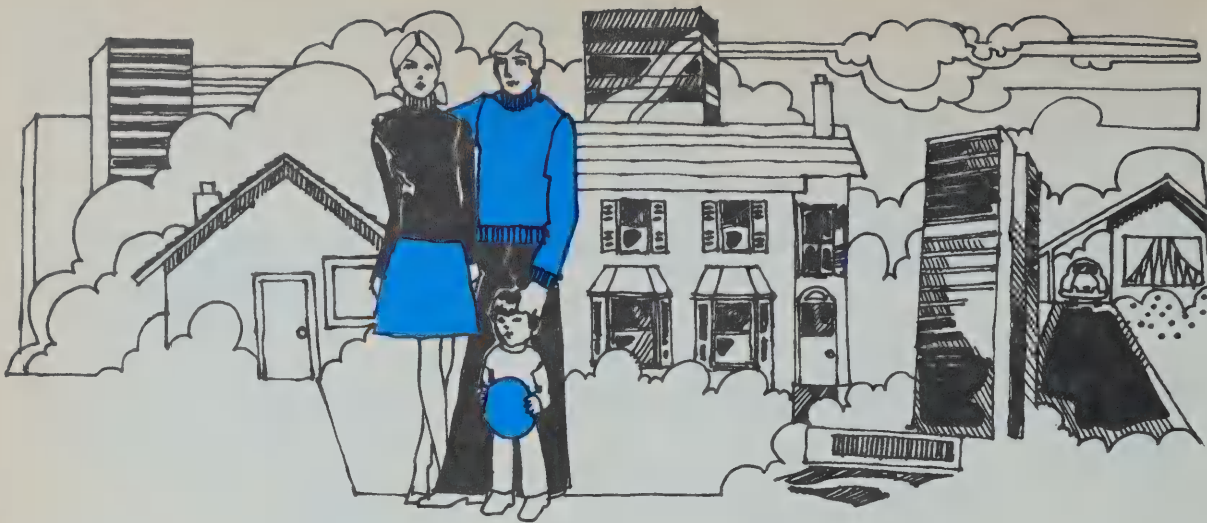
APPLICATION FOR REDEMPTION
DEMANDE DE REMBOURSEMENT

DATE

SIGNATURE OF REGISTERED OWNER
SIGNATURE DU PROPRIÉTAIRE IMMATRICULÉ

PAID STAMP OF REDEMPTION AGENT
TIMBRE DE L'AGENT DE REMBOURSEMENT

IDENTIFICATION



To Rent Or To Buy

Consider the situation of a young couple, Mr. and Mrs. F. Williams. Mr. Williams has received a promotion and, consequently, a transfer from Winnipeg to Vancouver. They have one child and are faced with the problem of finding a place to live. They have decided that they would prefer a house, or townhouse, rather than an apartment and are currently looking through newspapers for ideas.

The following three advertisements are indicative of the types of ads which they might see in the newspapers.

After seeing the many pages of different advertisements for houses to buy or to rent, Mr. and Mrs. Williams decided to get in touch with a real estate agent and discuss their particular situation with him.

Initially, the real estate agent questioned Mr. Williams on his general house requirements. For example, where Mr. Williams was working, how close to his work would he want to live, did they have a car, will Mrs. Williams have a car for shopping, what was the size of the family, had they any special preferences for a new or old house, or for a single- or two-storey house?

Having arrived at a fairly reasonable idea about the Williams home requirements, the agent then discussed the advantages of buying a house compared with the advantages of renting a house.

ADVANTAGES OF BUYING

- a good investment
- real estate prices rising
- a forced saving
- equity—the difference between the value of the property and what you owe on it
- feeling of pride and security
- enhances your credit reputation

ADVANTAGES OF RENTING

- if the renter does not like his house he can move relatively easy
- sometimes it is not that simple to sell a home
- no plumbing, roofing, etc. problems
- a good opportunity to get to know the different areas of the city

Don and Linda Williams finally decided to buy a home, therefore, the next question to be discussed was the amount of down payment available. The Williams had \$12 000 cash available, but the real estate agent felt that they should only make \$10 000 available as a down payment and hold back the \$2 000 for other incidental expenses. The next important question was what type of house could the Williams purchase with \$10 000 down payment?

The real estate agent then pointed out the fact that the Williams should take into consideration home im-

provements and maintenance, which is a never-ending expense. Taxes and insurance would also amount to about \$55 per month.

The real estate agent felt that the Williams could afford the home under discussion, or one in the similar price range, as the total monthly expenses did not exceed 30% of their monthly income.

Don and Linda left the agent's office to see some homes, with exciting prospects for their future stay in Vancouver in a home.

Unit 2, The Beaver Assoc. R.E. Ltd. Realtor

BIRCHMOUNT & LAWRENCE

Private sale. 3 bdrm. split level, solid brick bungalow, centrally air-conditioned, 2 baths with vanities, big L-shaped livingroom, modern kitchen, patio & carport, finished basement, Flintridge Rd. dead end quiet street. Exceptionally close to schools, shopping & TTC. \$69,500, down payment \$20,000 Call 751-8850 if no answer 469-0003

BEACHES

This 6 room brick home is waiting for owners who will enjoy its 2 fireplaces, its natural wood trim, and restore its pine floors to their original beauty. Asking \$52,900 Call Dianne Nowacki 690-6301

SHEPPARD REAL ESTATE LTD.

COSY & BRIGHT

Spacious brick bungalow, spotless, buy your own home now while you still can. Broadloom throughout, separate dining room, near TTC. Terms to suit your needs. Lil Lacoe 439-5505 The Beaver Assoc. Ltd. R.E. Ltd. Realtor

\$5000 DOWN

Research/Discuss

- *This depends on the possessions. Also, the places*

CHAPTER 26

where students live may or may not carry insurance. It is best to find out the nature of the situation and take steps to provide insurance coverage for any objects of particular value, such as watches or stereos.

- *A class will almost certainly have someone or know of someone who has been through a home burglary. Discuss police and insurance reports, police and insurance investigations, insurance payoff, and so on.*
- *This question is designed to develop first-hand familiarity with such policies and their clauses.*
- *The homeowner's policy provides personal liability insurance. The basic limit is \$25 000. Students may want to invent other hypothetical "disasters" and investigate their coverage.*

HOMEOWNER'S INSURANCE

RESEARCH/DISCUSS

- Should students living away from home carry insurance on their possessions?
- What is the series of events that occurs after a burglary of a home?
- Find a homeowner's insurance policy and examine the coverage carefully. Can you think of potential loss situations that are not covered?
- If your dog bites a friend who is visiting you, what kind of insurance would protect you against liability from a law suit?

IN THIS CHAPTER YOU WILL LEARN . . .

- what risks are covered in a homeowner's insurance policy
- the limits of liability of the insurance company
- how premiums are determined
- how premiums are financed on the installment plan
- about co-insurance clauses and how they affect an insurance claim

A homeowner's insurance policy is divided into two sections. The first section is concerned with physical damage to the property. The second section is concerned with the legal liability of the insured as a property owner.

Court costs and damages if someone sues for an injury.

SECTION I

Coverage A: Dwelling (the residence or home)

Coverage B: Appurtenances (detached garages, guest houses, tool sheds, or other structures on the property)

Such as cameras, sporting goods, binoculars, jewellery, and so on.

Coverage C: Personal property (furniture, clothing, and all personal property of the insured, except cash)

Coverage D: Additional living expenses (extra expense if the residents have to move out while repairs are made)

Such as hotel or motel expenses.

SECTION II

Coverage E: Personal liability (injury of anyone on or about the premises as a result of the insured's negligence; injury caused by the insured away from the premises as a result of sports activities; injury caused by the pets of the insured)

Such as ■ dog biting someone or a horse kicking someone.

Such as a guest slipping on a rug, ■ visitor falling on a broken step, an injury caused by ■ chair collapsing, or careless use of guns.

Coverage F: Medical payments (medical expenses *only* for anyone injured on or about the premises)

Coverage G: Physical damage to the property of others

Such as through careless use of spray paint or water; or children throwing or hitting balls.

Does not include liability for permanent disability or loss of earning power.

Such as hitting a golfer with a golf ball or breaking a window with a ball.

A homeowner's policy is written in four policy forms. The first three forms are for homeowners and the fourth form is for renters. The forms differ in the perils that are covered.

Lowest premium

Form 1: Standard form (all coverages in Sections I and II for certain named perils such as windstorm, hail, and explosion)

Does *not* cover any risk that is not named

Form 2: Broad form (same as Form 1 plus some additional perils such as damage from falling aircraft, collapse of the building, damage caused by riot and civil commotion, vandalism and storms)

Does *not* cover any risk that is not named

Includes all risks *except* those named.

Form 3: Dwelling special form (An "all risk" policy with a few named perils excluded. Only used in conjunction with Form 4.)

Highest premium

Form 4: Residence contents—broad form (Coverages C and D. Can be used alone for renters.)

Covers insured's improvements to the dwelling.

Mention that three-year policies are usually 15% to 20% cheaper than one-year policies. Most contracts are for one year. However, this will vary from province to province and from company to company.

Discussion Question. Why do fire insurance rates vary from province to province and from city to city? Consider: Number of fire stations serving the area; past performance of fire-fighters; usual construction of houses (some houses brick or stone, others primarily frame); frequency of fires; and so on.

A homeowner's insurance policy is usually written for a three-year period. This is a convenient length of time for both the homeowner and the insurance company. Table 26.1 shows the three-year prepaid premiums for a metropolitan area homeowner's policy. The minimum policy is for \$8000.

Metropolitan Territory
Homeowner's Policy
Three Year Prepaid Premiums

Dwelling (Coverage A)	Form 1	Form 2	Form 3 with 4
\$8000	\$96	\$118	\$125
\$9000	\$98	\$121	\$129
\$10 000	\$101	\$124	\$132
\$11 000	\$103	\$127	\$135
\$12 000	\$105	\$130	\$138
\$15 000	\$117	\$144	\$153
\$20 000	\$145	\$179	\$190
\$25 000	\$181	\$223	\$237
\$30 000	\$222	\$274	\$291
\$35 000	\$269	\$331	\$352
\$40 000	\$316	\$389	\$413
\$45 000	\$363	\$446	\$474
\$50 000	\$409	\$504	\$535
For each additional \$5000 add	\$47	\$58	\$61

table 26.1

Facts and Figures

What does this really mean? What effect might this have on Canada's agricultural position? How might this affect the housing situation in the urban areas? Could this have any effects on home insurance? Why?

FACTS AND FIGURES

Most Canadians live within 100 miles of the American border and most live in cities and towns. The 1966 census found that 65 percent of Canadians lived in 325 urban centres of 5000 population and over. It is forecast that by the year 2000, 90 percent of Canadians will be urban dwellers.

26 b / FINANCING THREE-YEAR PREMIUMS

Instead of paying the entire three-year premium at one time, a homeowner can arrange to pay it in three equal installments. There is an additional charge for this service. Although the charge varies with each company, 5% of the full three-year premium is common. The first installment is due when the policy is delivered; the second, on the first anniversary of the policy; and the third, on the second anniversary of the policy.

EXAMPLE

Find the charge to finance a homeowner's policy for \$25 000 with Form 2, when the finance charge is 5%. Then compute the amount of each installment.

Find the premium from table 26.1.

$$\text{Premium} = \$223$$

Find the finance charge.

$$0.05 \times \$223 = \$11.15$$

Add the finance charge to the premium.

$$\$223.00 + \$11.15 = \$234.15$$

Divide by three.

$$\$234.15 \div 3 = \$78.05$$

- The finance charge is \$11.15; each installment is \$78.05.

Obtain tables of premiums for one-year policies, and three-year policies. Also find out the financing rates. Have students compare the cost to finance a three-year policy with the cost of buying a one-year policy each year. Have students find the least expensive way to pay for insurance.

Facts and Figures

How does this average price compare with prices in your city? If your average price is higher, what factors could be influencing the price? If they are lower, why do you think they are?

FACTS AND FIGURES

In December, 1973, the average Toronto house was 30 percent up in price over 1972, and more than double the average price for 1966. The average price of houses in Toronto in December, 1973 was \$44 261.

EXERCISES Find the finance charge and the amount of each installment for these homeowner's policies. Use table 26.1 for the rates and 5% for the finance charge.

AMOUNT	FORM		AMOUNT	FORM	
1. \$8000	1	\$4.80; \$33.60	2. \$9000	2	\$6.05; \$42.35
3. \$10 000	3 with 4	\$6.60; \$46.20	4. \$15 000	3 with 4	\$7.20; \$50.40
5. \$20 000	1	\$7.25; \$50.75	6. \$25 000	3 with 4	\$11.85; \$82.95
7. \$30 000	3 with 4	\$14.55; \$101.85	8. \$35 000	3 with 4	\$17.60; \$123.20
9. \$17 500	3 with 4	\$8.58; \$60.03	10. \$18 000	2	\$8.25; \$57.75
11. \$26 000	1	\$9.46; \$66.22	12. \$27 500	2	\$12.43; \$86.98
13. \$29 000	3 with 4	\$14.01; \$98.07	14. \$43 000	3 with 4	\$22.48; \$157.36
15. \$55 000	3 with 4	\$29.80; \$208.60	16. \$53 000	3 with 4	\$28.58; \$200.06

26 C / LIMITS OF LIABILITY

When a loss occurs, the insurance company may pay only a part of the damages. The amount they pay, called the *limit of liability*, is determined by the amount of coverage. The limits of liability are:

Coverage A: Dwelling—the amount of coverage for which the policy is written

Coverage B: Appurtenances—10% of the limit on the dwelling

Coverage C: Personal property—50% of the limit of the dwelling, with 10% of this amount applying to personal property losses away from the premises. If the 10% is less than \$1500, the limit is \$1500

Coverage D: Additional living expenses—20% of the limit on the dwelling

Coverage E: Personal liability—\$25 000

Coverage F: Medical payments—\$500 for each person

Coverage G: Physical damage to the property of others—\$250

It is impossible to make a profit on an insurance loss. The insurance company will *never* pay more than the amount of the actual loss. This means that if the dwelling is over-insured and is a total loss, the limit of liability is the replacement cost of the damaged property regardless of the amount of insurance carried. For example, suppose a \$30 000 house is insured for \$40 000. If there is a fire and the house is a total loss, the insurance company will pay only \$30 000.

Limits of liability can be increased by paying an extra premium, which is only a fraction of the base premium. For example, \$10 000 can be raised to \$100 000 for an additional 27% of the premium cost. Since juries tend to award high indemnity in personal liability cases, it is wise to increase the limits of liability on personal liability coverages.

Answers to Exercises.

1. A: \$10 000; B: \$1000;
C: \$5000, \$1500; D: \$2000
2. A: \$15 000; B: \$1500;
C: \$7500, \$1500; D: \$3000
3. A: \$20 000; B: \$2000;
C: \$10 000, \$1500; D: \$4000
4. A: \$25 000; B: \$2500;
C: \$12 500, \$1500; D: \$5000
5. A: \$27 500; B: \$2750;
C: \$13 750, \$1500; D: \$5500
6. A: \$40 000; B: \$4000;
C: \$20 000, \$2000; D: \$8000

COVERAGES AND LIMITS OF LIABILITY

Fire, Lightning, Removal, and other perils, provided by Policy Form _____, and Endorsement No (s) _____ attached hereto, and subject to the conditions, limitations and exclusions therein.									
S E C T I O N I	A. Dwelling	B. Appurtenant Private Structures	C. Household and Personal Property on the Premises	D. Household and Personal Property away from the Premises	E. Additional Living Expense	S E C T I O N II	F. Comprehensive Personal Liability Bodily Injury and Property Damage	G. Medical Payments \$25,000 Each Accident	H. Physical Damage to Property of Others
	\$ 20 000	\$ 2 000	\$ 10 000	\$ 1 000	\$ 4 000		\$ 25 000 Each Occurrence	\$ 500 Each Person	\$250 Each Accident

An insurance policy usually contains several pages describing, in detail, the coverage included in the policy. On the first page of most policies, the limits of liability for the coverages are typed in by the insurance company. Since each insurance company has its own

way of listing the coverage, the forms may vary. Here, coverages C and D are equivalent to coverage C described above. Note that the limits of liability in each category are the same as described above.

EXERCISES Find the limits of liability of coverages A, B, C, and D for these homeowner's policies.

1. \$10 000 policy
2. \$15 000 policy
3. \$20 000 policy
4. \$25 000 policy
5. \$27 500 policy
6. \$40 000 policy

26 d / CO-INSURANCE CLAUSES

Discussion Question: Why might property be under-insured or over-insured?

Consider: Change in the value of the property since its purchase; misconception concerning the limits of liability; insurance on the land, which cannot be destroyed.

A co-insurance clause in a homeowner's policy limits the liability of the insurance company when the property is under-insured. That is, if the property is insured for less than its value, the homeowner must pay part of the loss. For example, suppose a \$30 000 house is insured for \$20 000. If there is a \$10 000 loss, the insurance company will not pay all \$10 000. Instead, it will pay a certain fraction of it.

$$\text{Liability} = \frac{\text{Amount of insurance}}{\text{Value of the property}} \times \text{Loss}$$

EXAMPLE

Find the limit of liability if property worth \$40 000 is insured for \$20 000 with a co-insurance clause and there is a \$15 000 loss.

$$\begin{aligned}\text{Liability} &= \frac{\$20\,000}{\$40\,000} \times \$15\,000 \\ &= \frac{1}{2} \times \$15\,000 \\ &= \$7500\end{aligned}$$

Mention that co-insurance clauses first appeared in policies on commercial buildings. They are sometimes called "average clauses," although that term is misleading.

The example above illustrates a 100% co-insurance clause. Most co-insurance clauses are 80% clauses. This means that the homeowner must carry coverages of at least 80% of the property's value. That is, if the property is not insured for at least 80% of its value, then the homeowner must pay part of the loss. Suppose, for example, a \$30 000 home is insured for \$25 000 and there is a \$10 000 loss. Since 80% of \$30 000 is \$24 000, the home is more than 80% insured. Therefore, the insurance company will pay the entire \$10 000.



The insurance company will *not* pay more than the replacement value of the property regardless of the amount of insurance.

Facts and Figures

What effect, if any, do you think these lakes have had on Canada's economic development?

FACTS AND FIGURES

With less than one percent of the world's population, Canada has nearly 15 percent of the World's fresh water surface. There are so many lakes in Canada that they have never been counted.

If the property is insured for less than 80% of its value, then

$$\text{Liability} = \frac{\text{Amount of insurance}}{80\% \text{ of property value}} \times \text{Loss}$$

Project: Visit your local fire department to find statistics on the number of home fires in your community during the past year. Find out the total value of losses from fire.

EXAMPLE

Find the limit of liability under an 80% co-insurance clause if a home valued at \$45 000 is insured for \$30 000 and there is a \$12 000 fire loss.

Since 80% of \$45 000 is \$36 000, the property is not 80% insured.

$$\begin{aligned} \text{Liability} &= \frac{\$30\,000}{80\% \times \$45\,000} \times \$12\,000 \\ &= \frac{\$30\,000}{\$36\,000} \times \$12\,000 \\ &= \frac{5}{6} \times \$12\,000 \\ &= \$10\,000 \end{aligned}$$

■ The limit of liability is \$10 000.

In addition to the liability from the co-insurance clause, keep in mind that the limit of liability is also fixed by these factors:

- (1) The amount of the insurance policy
- (2) The amount of the actual loss
- (3) The replacement value of the lost or damaged property

Discuss the ways in which homes may be damaged or destroyed. Make a list on the board. Have students decide which would be covered by the homeowner's policy and which would not.

In the example above, the amount of the insurance policy is \$30 000; the amount of the actual loss is \$12 000; and the replacement value of the property is \$45 000.



EXERCISES Find the limit of liability for the insurance company when these losses occur. All policies have an 80% co-insurance clause.

REPLACEMENT			REPLACEMENT		
AMOUNT OF INSURANCE	VALUE OF PROPERTY	AMOUNT OF LOSS	AMOUNT OF INSURANCE	VALUE OF PROPERTY	AMOUNT OF LOSS
1. \$10 000	\$15 000	\$4167	2. \$10 000	\$15 000	\$8333
3. \$10 000	\$15 000	\$10 000	4. \$15 000	\$20 000	\$4688
5. \$15 000	\$20 000	\$14 063	6. \$15 000	\$20 000	\$15 000
7. \$20 000	\$25 000	\$5000	8. \$20 000	\$25 000	\$15 000
9. \$20 000	\$25 000	\$20 000	10. \$25 000	\$35 000	\$4464
11. \$25 000	\$35 000	\$22 321	12. \$25 000	\$35 000	\$25 000
13. \$30 000	\$35 000	\$5000	14. \$30 000	\$35 000	\$30 000
15. \$30 000	\$35 000	\$30 000	16. \$40 000	\$35 000	\$35 000
		Total			Total

REVIEW / HOMEOWNER'S INSURANCE

CHECKLIST

Additional living expense (p. 355)
Appurtenances (p. 355)
Broad form (p. 355)
Co-insurance clause (p. 360)
Dwelling (p. 355)
Dwelling special form (p. 355)
Interpolate (p. 357)
Limit of liability (p. 355)
Medical payments (p. 359)
Over-insured (p. 355)
Personal liability (p. 355)
Personal property (p. 355)
Physical damage (p. 355)
Premium (p. 356)
Property value (p. 360)
Replacement value (p. 359)
Residence contents—broad form (p. 355)
Risk (p. 355)
Standard form (p. 355)
Under-insured (p. 360)

PROBLEMS

In problems 1 through 8, find the premiums for these homeowner's insurance policies using the rates in table 26.1.

1. Theodore applied for \$11 000 written on Form 1. **\$103**
2. Wilfred requested \$13 000 using Form 2. **\$134.67**
3. Adam had a contract for \$15 000 using Form 3 with 4. **\$153**
4. Hilary insured his home for \$16 500 with Form 2. **\$154.50**
5. Dion carried \$19 500 on his home with the policy written on Form 3 with 4. **\$186.30**
6. Leon was advised by his insurance agent to take a \$21 000 policy on his house, using Form 3 with 4. **\$199.40**
7. Beatrice insured her home for \$23,500 with Form 2. **\$209.80**
8. Sheldon, on the basis of the cost of his home, insured it for \$29 500 on Form 3 with 4. **\$285.60**

In problems 9 through 16, find the finance charge to pay

the premium in three equal installments. Then compute the amount of each payment. Use table 26.1 for the rates and 5% for the finance charge.

9. Maynard insured his home for \$17 500 with Form 1. **\$6.55; \$48.55**
10. Rodney was issued a policy for \$19,500 on Form 2. **\$8.78; \$61.43**
11. Adolph chose to insure his home for \$20 500 on Form 3 with 4. **\$9.74; \$68.15**
12. Hobart owned a \$25 000 home, which he fully insured with Form 2. **\$11.15; \$78.05**
13. Pierre purchased a home for \$28 000 and insured it for that amount on Form 3 with 4. **\$13.47; \$94.29**
14. Clifton paid \$30 000 to have a home built by an architect and insured it for that amount on Form 3 with 4. **\$14.55; \$101.85**
15. Gordon purchased a home for \$20 000 ten years ago and was advised that it was now worth \$26 000. He increased the amount of insurance to \$26 000 when he renewed the policy on Form 3 with 4. **\$12.39; \$86.73**
16. Mervin added a guest house to his property and increased his insurance to \$32 500 when he renewed it on Form 3 with 4. **\$16.08; \$112.53**

In problems 17 through 24, find the limits of liability for the insurance company under the physical damage coverages (Coverages A, B, C, and D) of the homeowner's policy.

17. Rollo had his property insured for \$16 000.
18. Denise had her home insured for \$17 500.
19. Clive carried \$21 000.
20. Norbert insured for \$24 500.
21. Frieda had an insurance contract for \$28 000.
22. Elliott insured for \$29 500.
23. Abner was protected to \$31 000.
24. Sidney carried \$34 750 on his home.

In problems 25 through 32, find the limits of liability of the insurance company when these fire losses occur. All policies have an 80% co-insurance clause.

25. Marion had \$11 000 insurance on property worth \$16 000. The loss amounted to \$5350. **\$4598**
26. Boris insured for \$16 000. His property was valued at \$23 500 and he had a loss of \$10 000. **\$8510**

27. Silas had a total loss on his \$25 000 home, which was insured for \$20 000. \$20 000
 28. Roger had \$28 000 insurance on his \$24 000 home. The home was a total fire loss. \$24 000
 29. Clinton had a \$10 600 loss on his \$32,000 home, which was insured for \$30 000. \$10 600
 30. Diana insured her \$33 000 home for its full value. She had a fire loss of \$18,365. \$18 365
 31. Simon insured his home for \$20 000. He paid \$29 500. for it. He had a fire loss \$20 000. \$16 940
 32. Grant had a total loss on his \$35 000 home, which was insured for \$25 000. \$25 000
2. What situations might arise where a homeowner would be sued for liability?
 3. What kind of financing can be arranged with the insurance company to pay the premium for a three-year homeowner's policy?
 4. What is co-insurance?
 5. What limitations are there on the liability of an insurance company when a loss occurs?
 6. In a homeowner's policy, what are "additional living expenses? "
 7. What advantages, if any, are there for over-insuring property?
 8. For purposes of adjusting an insurance claim, how is the value of property determined?
 9. Under what conditions, if any, can the homeowner make a profit from an insured loss?

QUESTIONS

1. What risks are covered in a homeowner's insurance policy?

Answers to Problems 17–24

17. A: \$16 000; B: \$1600; C: \$8000, \$1500; D: \$3200
18. A: \$17 500; B: \$1750; C: \$8750, \$1500; D: \$3500
19. A: \$21 000; B: \$2100; C: \$10 500, \$1500; D: \$4200
20. A: \$24 500; B: \$2450; C: \$12 250, \$1500; D: \$4900
21. A: \$28 000; B: \$2800; C: \$14 000, \$1500; D: \$5600
22. A: \$29 500; B: \$2950; C: \$14 750, \$1500; D: \$5900
23. A: \$31 000; B: \$3100; C: \$15 500, \$1500; D: \$6200
24. A: \$34 750; B: \$3475; C: \$17 375, \$1737.60; D: \$6950

Research/Discuss

- ☐ *Develop this guideline: Not more than 30% of the*

CHAPTER 27

monthly income should be spent on housing (rent or payments). Not more than 3 times the annual income should be spent on the cost of a home. Relate these amounts to the local housing situation.

- ☐ *From CMHA, banks, savings and loan associations, insurance companies, or through loan brokers.*
- ☐ *The value of property rises as the general price level rises.*
- ☐ *Discussion of this question may lead to heated controversy. But essentially, the use to which property can be put, and the income from such use determine "value." Controversy is usually generated by disagreement over estimates of this expected value.*

HOME FINANCING

RESEARCH/DISCUSS

- ☐ What is meant by the term "spiraling costs" when applied to the cost of homes in Canada?
- ☐ What guidelines can a family use in determining how much to spend for housing?
- ☐ Where can a homebuyer borrow money to finance his purchase?
- ☐ Why is buying a home considered a good hedge against inflation?
- ☐ What do you think makes property valuable or desirable?
- ☐ Should a young couple rent or buy a home?

IN THIS CHAPTER YOU WILL LEARN . . .

- ☐ what all is included in the carrying charges or monthly payments when buying a home.
- ☐ how to use an amortization schedule
- ☐ about reserves for insurance and taxes
- ☐ types of conventional Canadian mortgages
- ☐ how to compute pre-payment penalties

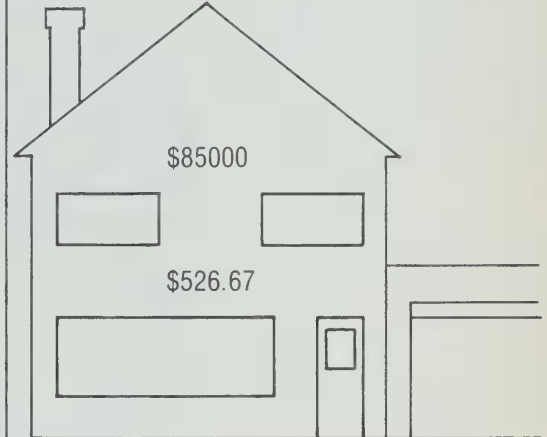
BROWNS'

$$\$32650 - \$3250 = \$29400 @ 9\frac{1}{2}\%$$



ROSCOES'

$$\$85000 - \$25000 = \$60000 @ 9\frac{3}{4}\%$$



Two Canadian couples, the Browns and the Roscoes each moved to a new home this year. Jeremy and Jean Brown, both in their mid-twenties and both working, purchase a small townhouse at \$32 650. For the Roscoes, it was their third purchase, and they bought an \$85 000 home situated in a community of successful middle-age Vancouverites.

Although the Browns and the Roscoes obviously have a different set of financial circumstances, each faced the same basic problems in arranging the financing of their homes.

Each couple summarized their total purchasing and financing résumé in an "offer to purchase" which outlined the entire buying procedure.

The "down-payment" is the cash which can be paid at time of purchase. The Browns had a minimum \$3250. The Roscoes, having recently sold their previous home, were able to make a \$25 000 payment.

The Browns assumed a government-controlled N.H.A. mortgage for \$29 400 repayable over 30 years at $9\frac{1}{2}\%$, while the Roscoes secured a "private" mortgage of \$60 000 at $9\frac{3}{4}\%$ interest and repayable in 25 years. (The Browns will pay monthly \$253.15; the Roscoes will pay \$526.67.)

The new owner will assume other "carrying costs" of property taxes and insurance.

Each mortgage will have terms for renewal, default, and pre-payment of principal.

27 a / HOME LOANS

Mention that rent on house payments should not exceed 40% of monthly income.

This table is the annuity that \$1.00 will buy. An annuity is a series of equal periodic payments. When you get a home loan, you are essentially selling an annuity to the lending institution. Then you pay off the annuity with a series of equal periodic payments (amortization).

Be sure students realize that only a portion of the table is shown here.

Experts in money management agree that a family can afford to buy a house that is approximately 3 times as much as its annual income. For a family with an income of \$10 800 a year, this means that a home costing \$32 400 is reasonable. The down payment may be 10%—\$3240 in this case—and so the remainder, \$29 160, will have to be borrowed from a bank or a savings and loan association to complete the purchase. The monthly payment will be about one-week's salary.

The usual method for repaying a home loan is to pay a fixed amount each month. The payment includes both interest and principal. This method is called *amortization*. Table III on page 396 can be used to find the payment necessary to amortize a loan of any size. Notice that the table shows the periodic payment necessary to pay off a loan of \$1.00. To find the payment for a loan of any other amount, such as \$7000, simply multiply the payment for a loan of \$1.00 by 7000. A portion of Table III is shown in table 27.1.

Period	1/2%	1 1/4%	1 1/2%	1 3/4%	2%	2 1/2%
1	1.005000	1.012500	1.015000	1.017500	1.020000	1.025000
2	.503753	.509399	.511277	.513166	.515049	.518827
3	.336674	.341707	.343385	.345068	.346754	.350135
4	.253138	.257862	.259446	.261032	.262624	.265817
5	.203011	.207562	.209091	.210620	.212158	.215247
6	.169598	.174034	.175527	.177021	.178525	.181550
7	.145730	.150089	.151557	.153029	.154511	.157495
8	.127828	.132133	.133584	.135041	.136509	.139467
9	.113906	.118170	.119610	.121057	.122515	.125457
10	.102768	.107002	.108434	.109875	.111326	.114258
11	.093657	.097868	.099294	.100730	.102177	.105106
12	.086064	.090258	.091680	.093113	.094559	.097487
13	.079641	.083821	.085240	.086672	.088118	.091048
14	.074135	.078305	.079723	.081155	.082601	.085536
56	.020518	.024937	.026521	.028157	.029846	.033372
57	.020206	.024634	.026223	.027866	.029561	.033102
58	.019904	.024343	.025936	.027585	.029286	.032842
59	.019614	.024061	.025660	.027314	.029022	.032593
60	.019332	.023789	.025393	.027053	.028767	.032353
61	.019061	.023527	.025136	.026801	.028522	.032122
62	.018798	.023274	.024887	.026558	.028286	.031901
63	.018543	.023029	.024647	.026324	.028058	.031687

table 27.1

Discussion Question: What are the advantages of owning a home?

Consider: Mobility; obligations; maintenance and repairs; aesthetic wants; future plans; expense.

EXAMPLE

Find the monthly payment necessary to amortize a home loan of \$10 000 payable in monthly installments for 5 years at 6% interest.

Find the number of monthly payments in 5 years.

$$5 \times 12 = 60$$

Find the rate of interest per month.

$$6\% \div 12 = \frac{1}{2}\%$$

Use Table III to find the payment necessary to pay off a loan of \$1.00 at $\frac{1}{2}\%$ for 60 payments.

\$0.019332

Multiply by 10 000 since $10\ 000 \times \$1.00 = \$10\ 000$

$10\ 000 \times \$0.019332 = \193.32

- The monthly payment is \$193.32.

Table III only shows values for up to 100 payments ($8\frac{1}{3}$ years of monthly payments). We can use the table, however, for contracts over $8\frac{1}{3}$ years by thinking of the payments as quarterly payments rather than monthly payments. After the quarterly payment has been determined, the approximate monthly payment is found by dividing the quarterly payment by three. This method will give a monthly payment a few cents higher than the true monthly payment because we are ignoring the interest between quarterly payments.

EXAMPLE

The purchaser of a home needs to borrow \$20 000 to finance the unpaid balance after the down payment. The interest rate is 8%. How much is the monthly payment if the loan is to be repaid in 25 years?

Find the number of quarterly periods in 25 years.

$25 \times 4 = 100$

Find the interest rate per quarter.

$8\% \div 4 = 2\%$

Use Table III to find the payment necessary to pay off a loan of \$1.00 at 2% for 100 payments.

\$0.023202

Multiply by 20 000.

$20\ 000 \times \$0.023202 = \464.04

Divide by three.

$\$464.04 \div 3 = \154.68

- The monthly payment is \$154.68.

EXERCISES Find the approximate monthly payments to amortize these home loans.

LOAN	INTEREST RATE	YEARS		LOAN	INTEREST RATE	YEARS	
1. \$5000	5%	9	\$57.78	2. \$7000	6%	10	\$78.00
3. \$8000	7%	11	\$87.41	4. \$9000	8%	12	\$97.80
5. \$10 000	8%	15	\$95.89	6. \$10 000	10%	15	\$107.84
7. \$12 000	5%	15	\$95.16	8. \$14 000	6%	$17\frac{1}{2}$	\$108.14
9. \$15 000	7%	$17\frac{1}{2}$	\$124.45	10. \$15 000	8%	20	\$125.80
11. \$20 000	8%	20	\$167.73	12. \$20 000	10%	20	\$193.51
13. \$22 000	6%	20	\$158.02	14. \$25 000	7%	$22\frac{1}{2}$	\$184.56
15. \$25 000	8%	25	\$193.35	16. \$25 750	8%	25	\$199.15

27 b / AMORTIZATION SCHEDULES

Point out that computers can be programmed to print out amortization schedules very quickly and accurately.

After determining the monthly payment necessary to amortize a home loan, an amortization schedule can be prepared. It shows the part of each payment that is interest and the part that is applied against the principal. The interest on the unpaid balance for each month is computed by simple interest and then subtracted from the monthly payment. The balance of the payment is subtracted from the unpaid balance of the loan. This process is repeated each month until the entire debt is paid.

EXAMPLE

Prepare an amortization schedule for the first five payments of a loan for \$15 000 that is to be amortized in 20 years. The interest rate is 6% and the monthly payments are \$107.47.

*Find the interest on \$15 000 for one month at 6% per year.
(Use $I = P \times R \times T$.)*

$$I = \$15\,000 \times \frac{6}{100} \times \frac{1}{12} = \$75$$

Subtract the interest from the monthly payment.

$$\$107.47 - \$75.00 = \$32.47$$

Subtract this amount from the unpaid balance on the loan to obtain the new unpaid balance.

$$\$15\,000.00 - \$32.47 = \$14\,967.53$$

Repeat the process for each installment, using the new unpaid balance as the amount on which one month's interest is computed. Record the calculations in a schedule:

AMORTIZATION SCHEDULE

Payment Number	Interest	Payment of Principal	Unpaid Balance
			\$15 000.00
1	\$75.00	\$32.47	\$14 967.53
2	\$74.84	\$32.63	\$14 934.90
3	\$74.67	\$32.80	\$14 902.10
4	\$74.51	\$32.96	\$14 869.14
5	\$74.35	\$33.12	\$14 836.02

Stress that simple interest is used for home loans while flat charges are used for other installment loans.

Mention that the principal paid off on the loan each month is a form of savings.



- The sum of the interest and the principal payment each month is always the same.
- The interest is less each month because the unpaid balance is less.

The *last* ten payments for the loan in the example above are shown below.

Payment Number	Interest	Payment of Principal	Unpaid Balance
231	\$5.22	\$102.25	\$941.11
232	\$4.71	\$102.76	\$838.35
233	\$4.19	\$103.28	\$735.07
234	\$3.68	\$103.79	\$631.28
235	\$3.16	\$104.31	\$526.97
236	\$2.63	\$104.84	\$422.13
237	\$2.11	\$105.36	\$316.77
238	\$1.58	\$105.89	\$210.88
239	\$1.05	\$106.42	\$104.46
240	\$0.52	\$104.46	\$ 0.00

Project: Compare the size of the loan (percent of property value), the down payment required, the interest rate, and the length of the loan for conventional, VLA, and NHA loans.

FACTS AND FIGURES

Main Components of the consumer price index, month of April

Item	1961	1969	1970	1971	1972	1973
All Items	100.0	124.6	129.7	132.2	138.2	147.3
Food	100.0	125.0	131.5	129.1	133.3	156.2
Housing & Household Operation	100.0	123.7	129.8	136.0	141.6	150.1
Clothing	100.0	124.3	126.8	127.9	131.1	136.4
Transportation	100.0	119.9	124.6	129.4	133.0	133.9
Health & Personal Care	100.0	133.7	139.3	141.4	148.0	154.1
Recreation & Reading	100.0	125.4	129.6	135.3	138.3	143.0
Tobacco & Alcohol	100.0	125.5	126.5	127.6	132.1	135.8

Facts and Figures

What item increased the most from 1961 to 1973? Can you give reasons for this increase? Which item increased the least? Can we expect to see this item remain relatively stable in the next ten years? Why or why not? What pattern has been followed since 1973 on the indexed cost of housing?

EXERCISES Prepare amortization schedules for the first five monthly payments for these loans. Use the format shown in the example above. *Answers are in back of book.*

LOAN	MONTHLY PAYMENT	INTEREST RATE	YEARS
1. \$10 000	\$111.03	6%	10
2. \$15 000	\$126.58	6%	15
3. \$15 000	\$162.37	8%	12
4. \$20 000	\$167.29	8%	20
5. \$20 000	\$179.95	9%	20
6. \$20 000	\$193.01	10%	20

A home loan agreement requires the homeowners to keep the property insured against loss from fire and other perils. To make sure the insurance policy is kept in force, the lender usually pays the premiums from money collected each month along with the loan payment.

Also, a homeowner is required by law to pay taxes on his property. Taxes may be between \$400 and \$1000 for a 3-bedroom home, and so a fund to pay taxes is usually set up. The money to pay these taxes is collected each month along with the payment for the loan amortization.

These two additions to the monthly installment are combined in an account called the *reserve for insurance and taxes*. The monthly payments for insurance and taxes are credited to the reserve account as they are received each month. Then, when the bills are paid, the account is charged.

For a three-year homeowner's insurance policy, the reserve is accumulated by charging $\frac{1}{36}$ of the three-year premium each month. The reserve for taxes is accumulated by charging $\frac{1}{12}$ of the annual tax bill each month.

THIS PORTION IS YOUR LOAN RECORD. PLEASE KEEP IT IN A SAFE PLACE
IT CONTAINS IMPORTANT INCOME TAX INFORMATION

TOTAL RECEIVED OR CHARGED	TRANSACTION BREAKDOWN			
	PRINCIPAL	INTEREST	IMPOUNDS	LATE CHARGE
231.00	24.40	128.60	78.00	
519.00	20,551.35	347.44	7.75	
IMPOUND BALANCE	LOAN BALANCE	TOT. INT. PD. THIS YR.	ANNUAL % RATE	TOT. R.E. TAX PD. THIS YR.

A LATE CHARGE OF \$23.10 WILL BE ASSESSED
IF PAYMENT IS RECEIVED AFTER 10-31-76.

GULLIVER, R D II & M L
2951 PINE AVE
VICTORIA, B.C.

TRANSACTION DATE 09-10-6	NEXT PYMT DUE DATE 15-10-76
4 A1 334572 LOAN NUMBER	71 COUNSELOR

- Mr. and Mrs. Gulliver pay \$231 each month on their home loan and impounds.
- ① The total of the principal and interest is \$153, as agreed on the original loan. On the next monthly payment, the principal will be slightly more and the interest will be slightly less.
 - ② The \$78 under impounds is held in reserve by the loan company to pay property taxes and insurance premiums.
 - ③ So far, \$519 has been impounded.
 - ④ As agreed at the time of the original loan, the late charge is equal to 10% of the total monthly payment. ($10\% \times \$231 = \23.10)

EXAMPLE

Find the monthly installment for paying a three-year insurance premium of \$160.

Divide the three-year premium by 36

$$\$160 \div 36 = \$4.44$$

- The monthly installment is \$4.44.

EXAMPLE

Find the monthly installment for paying an annual property tax bill of \$525.42.

Divide the annual tax by 12.

$$\$525.42 \div 12 = \$43.79$$

- The monthly installment is \$43.79.

EXAMPLE

Find the monthly installment for paying insurance and taxes. The three-year insurance premium is \$78.50 and the annual tax bill is \$452.33.

Find the installment for insurance.

$$\$78.50 \div 36 = \$2.18$$

Find the installment for taxes

$$\$425.33 \div 12 = \$35.44$$

Add the two installments.

$$\$2.18 + \$35.44 = \$37.62$$

- The monthly installment for insurance and taxes is \$37.62.

EXERCISES Find the total monthly payments to amortize the loan and to provide a reserve for paying the insurance and taxes.

THREE-YEAR			THREE-YEAR		
LOAN	ANNUAL	INSURANCE	LOAN	ANNUAL	INSURANCE
PAYMENT	TAXES	PREMIUM	PAYMENT	TAXES	PREMIUM
1. \$95.68	\$552.27	\$145.29 \$95.93	2. \$58.95	\$407.06	\$110.18 \$145.74
3. \$89.56	\$338.15	\$69.48 \$102.70	4. \$75.37	\$295.22	\$98.14 \$119.67
5. \$66.00	\$324.12	\$118.45 \$130.55	6. \$98.25	\$345.00	\$127.66 \$96.30
7. \$102.26	\$567.26	\$147.39 \$173.76	8. \$126.03	\$525.14	\$142.80 \$153.62
9. \$138.24	\$486.38	\$155.78 \$185.85	10. \$143.21	\$456.99	\$164.13 \$183.10
11. \$155.39	\$525.88	\$155.36 \$213.41	12. \$160.37	\$583.10	\$160.25 \$203.53
13. \$168.29	\$601.26	\$169.22 \$244.38	14. \$183.25	\$672.28	\$183.77 \$223.10
15. \$196.36	\$659.35	\$193.20 \$313.16	16. \$248.10	\$705.28	\$226.50 \$256.68

After a loan is approved and an amortization schedule has been set up, a due date is selected for the monthly payment. Most lending institutions will accept the monthly payment without a penalty if it is received within a grace period of 10 or 15 days after the due date. However, a payment received after the grace period is subject to a late payment penalty. This penalty varies with each lender. It may be either a flat fee or a percentage of the monthly payment. The grace period begins on the first day after the due date.

EXAMPLE

A home loan payment of \$89.55 is due on March 25 and is paid on April 10. The late payment charge after 15 days is 4% of the monthly payment. Compute the late payment charge, if any. Then find the amount of the monthly payment including the penalty.

Count the number of past due days to see if there is a penalty.

6 days late in March

+10 days late in April

16 days late. Therefore, the penalty is due.

Compute the penalty. It is 4% of the monthly payment.

$$0.04 \times \$89.55 = \$3.58$$

Add the penalty to the payment.

$$\$89.55 + \$3.58 = \$93.13$$

■ The penalty is \$3.58; the total payment due is \$93.13.

In the example above, we could also find the total payment by multiplying the monthly payment by 104%, the 100% payment plus the 4% penalty.

$$104\% = 1.04$$

$$1.04 \times \$89.55 = \$93.13$$

Point out the high interest cost for late payments: 4% for 15 days is an annual rate of 96%. The procedure of post-dated cheques safeguards against late payments.

Answers to Exercises.

- | | |
|--------------|--------------|
| 1. \$60.57 | 2. \$67.86 |
| 3. \$72.10 | 4. \$77.34 |
| 5. \$86.61 | 6. \$93.08 |
| 7. \$94.75 | 8. \$102.39 |
| 9. \$105.38 | 10. \$133.00 |
| 11. \$132.75 | 12. \$150.34 |
| 13. \$164.56 | 14. \$171.37 |
| 15. \$179.91 | 16. \$194.65 |

EXERCISES Find the loan payment due plus the late payment charge, if any. The grace period is 15 days and the late payment charge is 4%.

LOAN		PAYMENT		LOAN	
PAYMENT	DUE DATE	DATE		PAYMENT	DUE DATE
1. \$58.24	February 1	February 20		2. \$65.25	September 25
3. \$72.10	January 28	February 7		4. \$77.34	March 15
5. \$83.28	June 20	July 6		6. \$89.50	October 10
7. \$94.75	August 27	August 13		8. \$98.45	July 17
9. \$105.38	April 20	May 4		10. \$127.88	May 12
11. \$132.75	January 16	January 31		12. \$144.56	April 1
13. \$158.23	December 20	January 8		14. \$164.78	March 15
15. \$172.99	November 15	December 1		16. \$187.16	June 18
					October 14
					March 30
					October 28
					August 2
					May 28
					April 21
					March 31
					July 8

When a lender makes a loan, he expects to realize a profit from the interest earned on the loan. Suppose the borrower decides that he wants to pay off the loan with a lump sum instead of by the scheduled installments. Then the lender will not get the interest income he expected. For this reason, most loan contracts contain a clause calling for a penalty when a loan is paid before it is due.

Pre-payment penalties vary with the lending institution. In some instances, if a loan is paid off within five years of the contract date, the pre-payment penalty is all of the unearned interest unpaid on the loan. At another institution, the penalty may be the interest on the loan for a certain number of months. The most common method is to charge a fixed percent of the unpaid balance at the time the loan is paid off.

EXAMPLE

The unpaid balance on a loan is \$10 593.64. The borrower, according to his loan agreement, must pay a penalty equal to 6% of the unpaid balance at the time the loan is paid off. Compute the pre-payment penalty and the amount needed to pay off the loan.

Find the penalty.

$$6\% \times \$10\,593.64 = \$635.62$$

Add the penalty to the unpaid balance.

$$\$10\,593.64 + \$635.62 = \$11\,229.26$$

- The pre-payment penalty is \$635.62; the amount needed to pay off the loan is \$11 229.26.

The amount needed to pay off the loan can also be computed in one step by multiplying the unpaid balance by $100\% + 6\%$ or 106% .



Point out that loans are usually paid off with a lump sum only when the owner is selling the house.

Mention that a wise buyer will negotiate the pre-payment fee before signing if he intends to pre-pay the loan.

Project. Visit a real estate office to study the houses offered. Ask how values are established. Find out what the current trends are in housing.

EXERCISES Compute the pre-payment penalty and the total amount needed to pay off these loan balances.

LOAN BALANCE	PRE-PAYMENT PENALTY	LOAN BALANCE	PRE-PAYMENT PENALTY
1. \$881.00	6% \$52.86; \$933.86	2. \$1641.30	6% \$98.48; \$1739.78
3. \$5738.46	5% \$286.92; \$6025.38	4. \$8759.58	5% \$437.98; \$9197.56
5. \$2286.70	7% \$160.07; \$4589.58	6. \$3425.12	7% \$239.76; \$3664.88
7. \$4329.79	6% \$259.79; \$2446.77	8. \$6405.19	6% \$384.31; \$6789.50
9. \$10 360.01	5½% \$569.80; \$10 929.81	10. \$12 464.84	5½% \$685.57; \$13 150.40
11. \$14 074.23	5½% \$774.08; \$14 848.31	12. \$15 630.05	6½% \$1015.95; \$16 646.00
13. \$11 192.79	6½% \$727.53; \$11 920.32	14. \$14 795.68	6¼% \$924.73; \$15 720.40
15. \$13 381.52	6¾% \$903.25; \$14 284.77	16. \$15 286.70	6⅔% \$1019.62; \$16 306.00

CHECKLIST

Amortization (p. 366)
Amortization schedule (p. 368)
Balance (p. 368)
Grace period (p. 372)
Interest (p. 366)
Late payment charge (p. 372)
Lending institution (p. 372)
Loan (p. 366)
Monthly payment (p. 366)
Monthly installment (p. 366)
Pre-payment penalty (p. 373)
Principal (p. 366)
Reserve for insurance (p. 370)
Reserve for taxes (p. 370)

PROBLEMS

In problems 1 through 8, find the approximate monthly payments to amortize the home loans. First, find the quarterly payment, and then divide it into three equal monthly payments.

1. Rod borrows \$7500 to finance the unpaid balance on a cottage home with 12% interest for 15 years. **\$126.97**
2. David arranges a loan for \$10 000 at 6% interest for 12 years. **\$97.92**
3. Barbara obtains financing from a credit union for \$16 000 to purchase a mobile home with 8% interest for 20 years. **\$134.19**
4. The Provincial Life Insurance Company loans Irving \$19 000 to finance his home with 10% interest for 25 years. **\$172.97**
5. Jacques arranges his home loan through a chartered bank for \$17 000 with 10% interest for 20 years. **\$164.48**
6. Jeff borrows \$18 000 from his brother with an agreement to repay it in 20 years with 8% interest. **\$150.96**
7. Eric obtains a loan of \$13 000 from his bank with 12% interest for 10 years. **\$289.70**
8. Craig arranges a loan for \$22 500 with 8% interest for 25 years. **\$174.02**

Answers are in back of book.

In problems 9 through 16, prepare amortization schedules for the first five monthly payments.

9. Andrew repays a loan of \$10 000 with monthly payments of \$120.06 for 9 years with 6% interest included.
10. Gervais has a monthly payment of \$102.47 with 6% interest on a loan of \$15 000 for 22 years.
11. Gwendolyn financed \$16 000 for 18 years at 8% with payments of \$140 a month.
12. Giles arranged a loan of \$12 000 for 23 years with 8% interest to be paid in monthly installments of \$95.22.
13. Eddie pays \$152.37 per month to finance a home loan of \$20 000 for 30 years with 8.4% interest.
14. Ivor was granted a loan of \$18 000 to be repaid in monthly installments of \$167.10 for 17 years at $8\frac{1}{2}\%$ interest.
15. Sheila received a loan of \$9900 with monthly payments of \$89.08 for 20 years with 9% interest.
16. Virginia arranged a loan of \$9000 for 10 years at 10% interest with monthly payments of \$118.94.

In problems 17 through 24, compute the amount of the monthly payment including repayment of the loan and the reserve for insurance and taxes. All insurance policies are for three years and the taxes are for one year.

17. Andrea pays \$102.10 to amortize her loan. The taxes are \$355.86 and the insurance premium is \$104.20. **\$134.65**
18. Mark's loan payment is \$118.36, the insurance is \$123.70, and the taxes are \$405.50. **\$155.59**
19. Stephen pays \$126.25 on his home loan, \$99.86 for his insurance, and \$330.90 for his taxes. **\$156.60**
20. Brian has a loan payment of \$135.50, a tax bill of \$425.88, and insurance of \$140.24. **\$174.89**
21. Peter is billed for \$155 on his home, \$163.21 for insurance, and \$504.77 for taxes. **\$201.59**
22. William owes \$176.35 per month on his home payment, \$184.26 for his insurance, and \$610.55 for his taxes. **\$232.35**
23. Ray has a loan payable at \$180.33 per month, taxes of \$456.32, and insurance of \$133.77. **\$222.08**

24. Vivian pays \$210 on her home, \$224.50 for insurance, and \$721.32 for taxes. **\$276.35**

In problems 25 through 32, find the loan payment due plus the late payment charge, if any. The grace period is 15 days, and the late payment charge is 5% of the monthly payment.

25. Lance's payment of \$132.30 was due February 1 and he paid it on February 18. **\$138.92**
26. Michael owes \$143.66 on March 26. He paid it on April 11. **\$150.84**
27. Adam's payment of \$166.40 is due on January 10, and he paid it on January 2. **\$166.40**
28. Eleanor's payment of \$138.54 was paid on July 10 but was due on June 24. **\$145.47**
29. Margo owes \$173.22 on the 10th of every month. Her April payment was received on April 27. **\$181.88**
30. Carl was three weeks late in making his payment of \$192.33. **\$201.95**
31. Paul's payment of \$188, due on August 23, was paid on September 7. **\$188.00**
32. Charles made his payment of \$159.30 18 days late. **\$167.27**

In problems 33 through 40, compute the pre-payment penalties, and the amount needed to pay off the loan.

33. Ian had a loan balance of \$3257.24 and the pre-payment penalty is 5%. **\$162.86; \$3420.10**
34. Phillip owed a balance of \$5034.18 and the penalty is 6%. **\$302.05; \$5336.23**

35. Nora paid off a loan balance of \$6753 with a penalty of 7%. **\$472.71; \$7225.71**
36. Justin paid off a loan of \$7974.38 with a penalty of $5\frac{1}{2}\%$. **\$438.59; \$8412.97**
37. Patrick had a balance of \$8338.48 and had to pay a penalty of $6\frac{1}{4}\%$. **\$521.16; \$8859.64**
38. Theresa inquired about pre-paying her loan balance of \$3775 and learned that the prepayment penalty is 7%. **\$264.25; \$4039.25**
39. Jonathan owed \$10 739 and the penalty is 8%. **\$859.12; \$11 598.12**
40. Richard won \$25 000 in cash from a magazine contest. He decided to pay off his home loan of \$21 357.20 with a pre-payment penalty of 5%. **\$1067.86, \$22 425.06**

QUESTIONS

1. What is the meaning of the expression "to amortize a loan?"
2. What is an amortization schedule?
3. How is an amortization schedule prepared?
4. What is a reserve for insurance and taxes?
5. How are late payment charges computed?
6. What is the grace period for loan payments?
7. What is a pre-payment penalty?
8. How are pre-payment penalties computed?
9. Where do you go to arrange a home loan?
10. Why is the purchase of a home considered an investment?

DO-IT-YOURSELF: BUILDING MATERIALS

CHAPTER 28

Research/Discuss

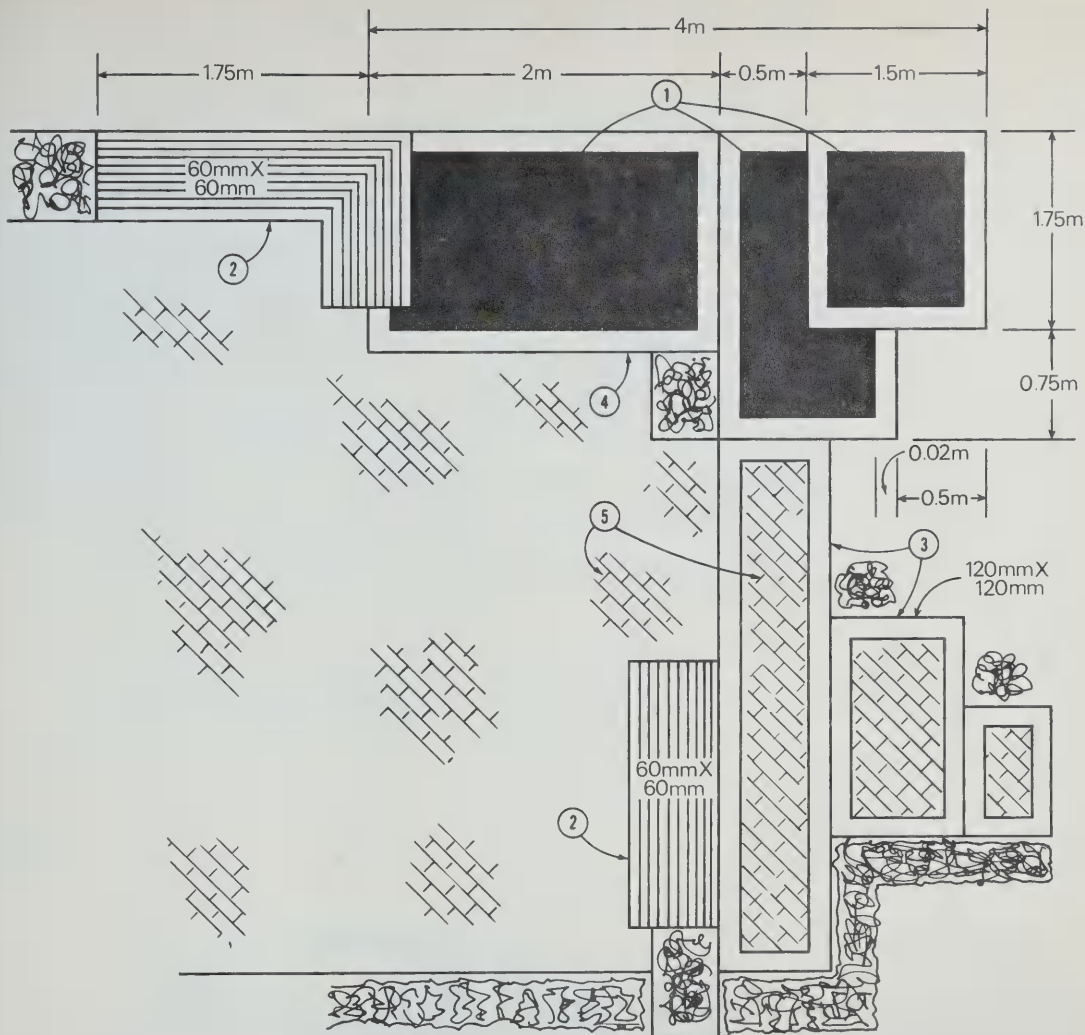
- *Elicit from students that a considerable saving can be made in labour costs, and that the creativity involved is an additional enjoyment.*
- *This opinion question can lead to consumer projects, in comparing costs involved in attaining the decor of one's dreams.*
- *If the class is interested in these home-handyman hints, lively discussions can be developed regarding how to store and care for tools and supplies; such as this hint on storing left-over paint. Store paint in tightly sealed cans with a thin film of turpentine over oil base paints and a thin film of water over rubber-base paints. Also, it is a good idea to put a mark on the can at the paint level to show the quantity without opening the can.*

RESEARCH/DISCUSS

- What benefits can be derived from the successful completion of a do-it-yourself project?
- What do you feel is necessary in a comfortable room?
- What are some ways to care for tools, equipment, and partially used materials?

IN THIS CHAPTER YOU WILL LEARN . . .

- how to find the cost when buying wall panelling
- how to decide how much concrete is necessary for a product
- how to estimate the number of bricks to buy
- how to estimate the amount of paint to buy



A careful scale drawing is always needed when you begin a building or remodelling project. It helps you “see” the finished project before you begin and is useful in purchasing materials.

- ① In this patio plan, three pools form a focal point.
- ② Benches of redwood 60×60 mm are in opposite corners.
- ③ The framing for the three steps is redwood 120×120 mm.
- ④ Concrete, 15 cm thick, is used for the pool sides.
- ⑤ The patio and the steps are paved with bricks laid in a diagonal pattern.

Recently, many homeowners have been using paneling to line the interior walls of homes. Most basements today are finished with paneling. There are three basic types of paneling: Hardwood paneling, Printed Overlay paneling, and Hardboard paneling. Hardwood paneling is the most expensive because of the scarcity of oak and other hardwoods. Printed Overlay paneling consists of printed vinyl which is attached to a 5 mm thick piece of imported luan mahogany. The Hardboard panel has the finish photographed on to it by a special process, is the thickest of the three, and goes by such brand names as Masonite, Abitibi, and others. Both Hardboard and Printed Overlay paneling are competitively priced.

Paneling is available in thicknesses of 4 mm to 6 mm. The standard panel size is 120 cm × 240 cm. The height of the panel is 240 cm because that is the standard height for a room. The panels are 120 cm wide because the strapping, to which the panel is attached, is centred every 40 cm, according to current building code regulations. Thus, you will find grooves at the edges of the panel and at 40 cm and 80 cm, so that the nail heads will not be seen.

EXAMPLE

Find the cost to panel a wall with knotty pine that sells for \$14.95 per panel if the room is 240 cm high and the wall is 360 cm long.

Divide the length of the wall by the standard width of a panel to find the number of panels required.

$$360 \div 120 = 3$$

Multiply the required number of panels by the cost per panel.

$$3 \times \$14.95 = \$44.85$$

- The paneling costs \$44.85.

Point out that before purchasing materials for a do-it-yourself project, it is a good idea to visit several stores to compare prices and quality.

You will probably find that prices for building materials vary greatly. This is usually caused by the quality of the material itself. In the case of paneling, the wood grain surface may be either paper, or a thin plastic coating bonded to wood, or a thin wood layer bonded to a less expensive wood, or solid wood of the type advertised. It is important for consumers to know what grade of building material they need for their purpose.



Beautiful
HARDWOOD PANELING

A TERRIFIC BUY AT
\$6⁴⁹

**YOUR CHOICE OF
1200 mm x 2400 mm SHEETS**

- ANTIQUE WALNUT
- COLONIAL CHERRY
- RUSTIC OAK
- MANY OTHERS

Simpson Lumber Yard • 3 west layton street

Many times a room you wish to panel may have windows and doors and would appear not to require as many panels. Since paneling may only be purchased in full sheets, more material than is needed is usually purchased. It is not considered wise to use leftover pieces in small places as above windows or doors since the wood grain effect of the panels would be disrupted.

EXAMPLE

Find the cost to panel a room with elm which sells for \$16.40 a panel if the room is 600 cm long by 360 cm wide and is 240 cm high.

Since there are four sides to a room, multiply $600 \text{ cm} \times 2 = 1200 \text{ cm}$ to find the length. Multiply $360 \text{ cm} \times 2 = 720 \text{ cm}$ to find the required width.

The total length of the room is $1200 \text{ cm} + 720 \text{ cm} = 1920 \text{ cm}$.

Divide the total length of the room by the standard width of a panel to find the number of panels required.

$$1920 \div 120 = 16$$

Multiply the required number of panels by the cost per panel.

$$16 \times \$16.40 = \$262.40$$

- The paneling costs \$262.40.

EXERCISES Find the cost of paneling to cover these 240 cm high walls in rooms of varying dimensions.

REMEMBER: Paneling can only be purchased in 120×240 cm sheets.

HARDWOOD	ROOM DIMENSIONS (IN CM)	PRICE PER PANEL	
1. Birch	240×360	\$15.50	\$155.00
2. Elm	360×720	\$16.40	\$295.20
3. Walnut	420×600	\$29.50	\$501.50
4. Oak	300×480	\$17.90	\$232.70
PRINTED OVERLAY			
5. Birch	360×360	\$ 6.79	\$81.48
6. Walnut	360×840	\$ 6.79	\$135.80
7. Oak	270×300	\$ 7.54	\$71.63
8. Pecan	330×420	\$ 7.15	\$92.95
9. Rosewood	360×600	\$ 8.15	\$130.40

Mention that using dry sacks of pre-mixed concrete is expensive except for small jobs.

The foundation of every building rests on concrete. Concrete is also used for driveways, patios, walls, steps, floors, curbs, gutters, and sidewalks. It is a mixture of sand, gravel, water, and cement (powdered lime and clay). Concrete can be purchased in three different ways:

- (1) The raw materials may be bought separately and mixed at the building site.
- (2) Dry sacks of pre-mixed concrete may be purchased and water added at the time of use.
- (3) Wet “ready-mixed” concrete may be purchased by the cubic metre for delivery at the building site for immediate use.

In planning a project using concrete, you must first determine how much you need. That is, you need to know how many cubic metres of concrete are necessary. A cubic metre is a measure of volume. In this case, it is the amount of concrete needed to fill a space 100 cm long, 100 cm wide, and 100 cm deep. There are 1 000 000 cubic centimetres in a cubic metre. Since most large measurements are made in metres, it is easier to determine the number of cubic metres needed. It is also easier to simply measure a space in metres to arrive at the number of square metres in the case of large measurements.

EXAMPLE

Find the amount of concrete needed to pour a driveway 600 cm long and 480 cm wide. The concrete must be 10 cm deep.

Multiply the length by the width by the depth to find the number of cubic centimetres.

$$600 \text{ cm} \times 480 \text{ cm} \times 10 \text{ cm} = 2\,880\,000 \text{ cm}^3$$

Divide by 1 000 000 to find the number of cubic metres.

$$2\,880\,000 \text{ cm}^3 \div 1\,000\,000 = 2.880 \text{ cubic metres}$$

- 2.88 cubic metres of concrete are needed.

Project: Decide on a project using concrete and determine how much concrete you will need. How much will the project cost if you buy raw materials and mix them yourself? If you buy dry sacks of pre-mixed concrete? If you buy wet, ready-mixed concrete?

EXAMPLE

Find the cost of concrete for a retaining wall 1500 cm long, 90 cm high, and 30 cm thick. The price of wet, ready-mixed concrete is \$37.95 per cubic metre.

Find the volume of concrete needed to fill the forms for the wall.

$$1500 \text{ cm} \times 90 \text{ cm} \times 30 \text{ cm} = 4\,050\,000 \text{ cm}^3$$

$$4\,050\,000 \text{ cm}^3 \div 1\,000\,000 = 4.050 \text{ cubic metres}$$

Multiply the number of cubic metres by the cost per cubic metre.

$$4.050 \times \$37.95 = \$153.70$$

- The concrete cost is \$153.70.

What factors influence the excessive spending on new housing?

Why are apartments popular places of abode?

What are the advantages of owning your own home? disadvantages?

FACT AND FIGURES

As in all developing countries, construction plays a dominant role in Canada's economy.

In the past 15 years, over \$30 billions were spent on new housing.

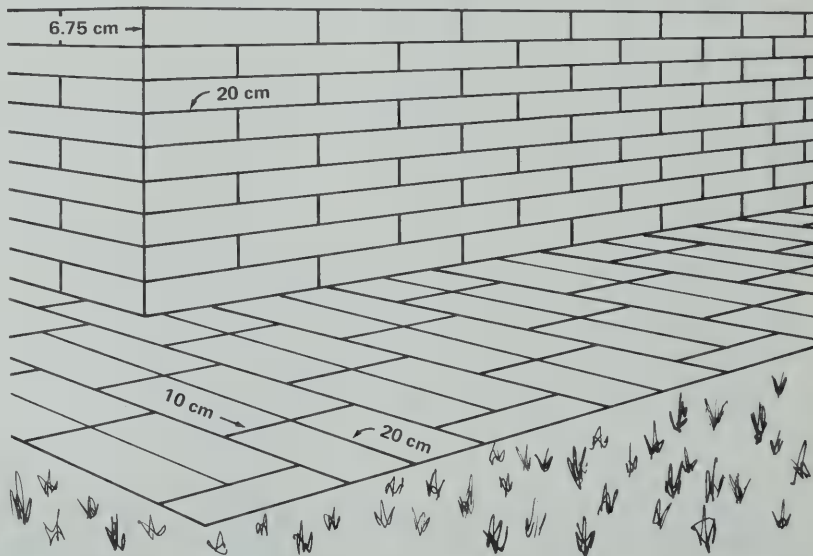
In 1972, housing starts totalled 249 914 (a new record high): single dwellings, 115 570; duplexes and semi-detached houses, 13 649; row housing, 16 900; apartments, 103 715.

EXERCISES Find the cost of concrete for these projects. The price of wet, ready-mixed concrete is \$37.95 per cubic metre.

PROJECT	DIMENSIONS	
1. Patio	900 cm × 840 cm × 10 cm	\$286.90
2. Garage floor	630 cm × 540 cm × 10 cm	\$129.11
3. Sidewalk	225 cm × 180 cm × 10 cm	\$15.37
4. Driveway	570 cm × 780 cm × 10 cm	\$168.73
5. Wall	1200 cm × 75 cm × 20 cm	\$68.31
6. Foundation	2 sides 1200 cm each 2 sides 960 cm each height 45 cm width 25 cm	\$184.44
7. Patio	960 cm × 780 cm × 10 cm	\$284.17
8. Garage floor	600 cm × 600 cm × 10 cm	\$136.62
9. Sidewalk	3150 cm × 150 cm × 10 cm	\$179.31
10. Driveway	690 cm × 900 cm × 10 cm	\$235.67
11. Wall	1560 cm × 90 cm × 25 cm	\$133.20
12. Foundation	2 sides 1350 cm each 2 sides 1200 cm each height 45 cm width 20 cm	\$174.10
13. Curb	1800 cm × 20 cm × 5 cm	\$6.83
14. Patio	450 cm × 540 cm × 10 cm	\$92.22
15. Floor	540 cm × 570 cm × 10 cm	\$116.89
16. Driveway	540 cm × 900 cm × 20 cm	\$368.87

Many beautiful homes, fireplaces, patios, barbecue pits, and walls are built with bricks. Bricks are available in a variety of colours and shapes. At this time, the building industry is not certain which measures to adopt for the purposes of metrification. Some industry spokesmen prefer the use of millimetres for measurement purposes, while others favour the centimetre. Australia has adopted the millimetre as the standard for the measurement of brick sizes. At the present time, it appears that brick sizes may be in centimetres. For the purpose of this exercise, a standard brick will be $6.75 \text{ cm} \times 10 \text{ cm} \times 20 \text{ cm}$.

In order to build fireplaces and walls, the bricks must be stacked, and each square metre of vertical area requires more bricks. When we compare a $10 \text{ cm} \times 20 \text{ cm}$ surface of a brick laid flat to a $6.75 \text{ cm} \times 20 \text{ cm}$ side when stacked, we find that more bricks are required for the job.



The price of bricks is quoted per thousand (per M). The price of one brick can be found by dividing the price per M by 1000. For instance, if the price per thousand is \$90, the price per brick is $\$90 \div 1000$ or \$0.09.

EXAMPLE

Find the cost of bricks to cover a patio that is $540 \text{ cm} \times 660 \text{ cm}$ if the price is \$135 per M.

Find the number of square centimetres to be covered.

$$540 \text{ cm} \times 660 \text{ cm} = 356\,400 \text{ square centimetres}$$

Divide the number of square centimetres by 200 square centimetres.

$$356\,400 \div 200 = 1782 \text{ square centimetres}$$

Since the price per M is \$135, the price of one brick is $\$135 \div 1000$ or \$0.135. Multiply the number of bricks by the price for one brick.

$$1782 \times \$0.135 = \$240.57$$

- The bricks cost \$240.57.

EXAMPLE

Find the cost of bricks at \$145 per M to build a wall 600 cm long, 150 cm high, and 20 cm wide.

Find the number of square centimetres of vertical area.

$$600 \text{ cm} \times 150 \text{ cm} = 90\,000 \text{ square centimetres}$$

Divide the number of square centimetres by 135 square centimetres.

$$90\,000 \div 135 = 667 \text{ bricks}$$

Since the wall is 20 cm wide and a brick is 10 cm wide, the wall is two bricks wide. Find the number of bricks required.

$$2 \times 667 = 1334$$

Since the price per M is \$145, the price for one brick is $\$145 \div 1000$ or \$0.145. Multiply the number of bricks by the price of one brick.

$$1334 \times \$0.145 = \$193.43$$

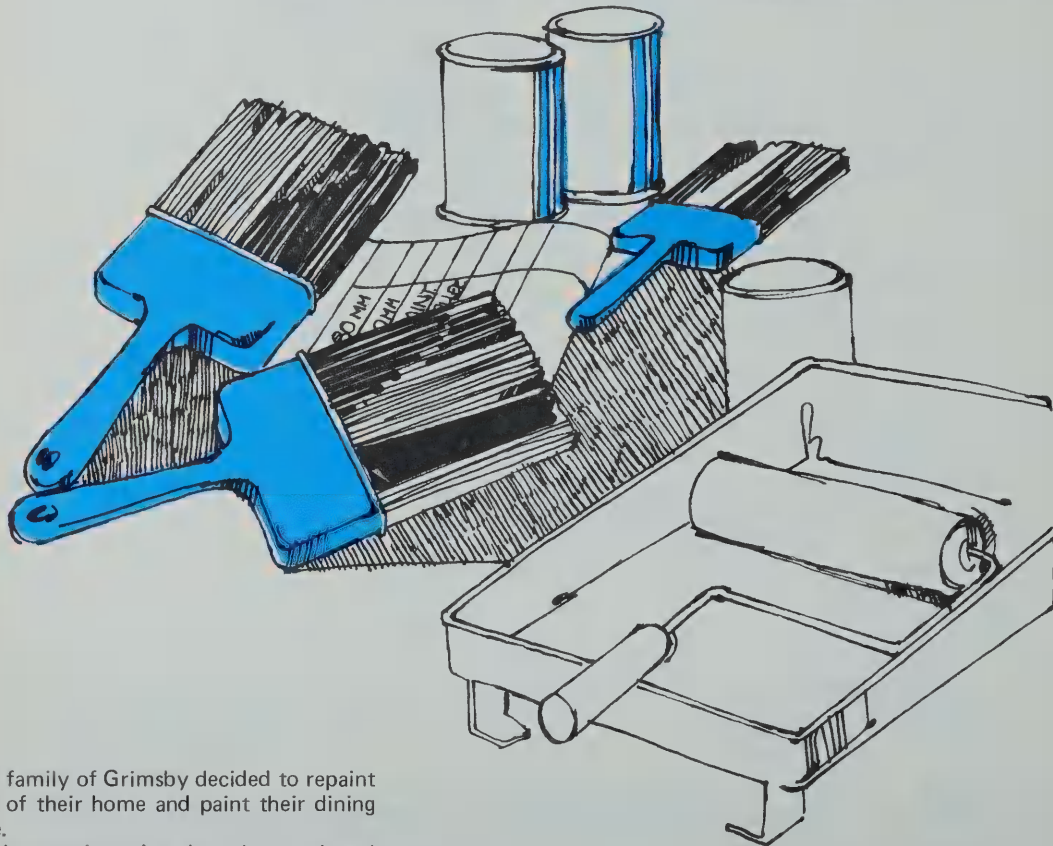
- The bricks cost \$193.43.

EXERCISES Find the cost of the bricks for these projects if the price is \$140 per M.

PROJECT	DIMENSIONS		PROJECT	DIMENSIONS	
1. Patio	840 cm × 990 cm	\$582.12	2. Wall	1110 cm × 105 cm	\$241.73
3. Floor	630 cm × 720 cm	\$317.52		(20 cm wide)	
5. Patio	765 cm × 870 cm	\$465.89	4. Planter Box	2 sides 2.690 cm	
7. Barbecue	2 sides 45 cm each			2 ends 45 cm each	
Pit	2 sides 60 cm each			Height 30 cm	\$19.54
	height 90 cm	\$19.60	6. Sidewalk	1200 cm × 180 cm	\$151.20
9. Floor	480 cm × 540 cm	\$181.44	8. Patio	600 cm × 600 cm	\$252.00
11. Patio	630 cm × 960 cm	\$423.36	10. Sidewalk	750 cm × 120 cm	\$63.00
13. Wall	240 cm × 480 cm	\$119.47	12. Floor	450 cm × 450 cm	\$141.75
15. Floor	480 cm × 705 cm	\$236.88	14. Patio	675 cm × 810 cm	\$382.73
			16. Sidewalk	750 cm × 90 cm	\$47.25

One of the easiest do-it-yourself tasks is painting. There are many fine-quality paints on the market today, and many are very simple to use. They dry quickly to a smooth finish without showing brush or roller marks. Furthermore, rubber base paints dissolve easily with water. Therefore, brushes, rollers, and paint pans can be cleaned with soap and water. These fine paints are available for both interior and exterior use.

Paint will probably be sold in 5 litre cans and litre cans.



The Hadler family of Grimsby decided to repaint the outside of their home and paint their dining room inside.

Besides the exterior paint, they also purchased two 80 mm brushes for the outside.

Besides the interior latex paint, they purchased a 40 mm brush and a roller kit.

Sales tax was charged at a rate of 7%.

If one 5 litre can of exterior paint will cover approximately 40 square metres, how many square metres can they cover with three 5 litre cans? 120 square metres

The amount of paint required for a job depends on the number of square metres to be covered and the number of coats to be applied. Most 5 litre paint cans will cover 40 to 45 square metres depending on how thick the paint is applied.

EXAMPLE

Find the amount of paint needed to cover a wall that is 2.40 metres high and 3.20 metres long. Assume a 5 litre can of paint will cover 40 square metres.

Find the number of square metres to be covered.

$$2.40 \times 3.20 \text{ metres} = 7.68 \text{ square metres}$$

Since a 5 litre can of paint will cover 40 square metres, a litre of paint will cover $40 \div 5$ or 8 square metres.

- One litre of paint is required.

EXAMPLE

Find the amount of paint needed to cover the walls, doors, and ceilings of a room 3.20×4.50 metres. The room has a standard height of 2.40 metres. Assume a 5 litre can of paint covers 45 square metres.

Find the number of square metres to be covered. Two walls are 2.40×3.20 metres.

$$2 \times 2.40 \text{ metres} \times 3.20 \text{ metres} = 15.36 \text{ square metres}$$

Two walls are 2.40×4.50 metres.

$$2 \times 2.40 \text{ metres} \times 4.50 \text{ metres} = 21.60 \text{ square metres}$$

The ceiling is 3.20×4.50 metres.

$$3.20 \text{ metres} \times 4.50 \text{ metres} = 14.40 \text{ square metres}$$

$$15.36 + 21.60 + 14.40 = 51.36$$

Since a 5 litre can of paint will cover 45 square metres, a litre of paint will cover $45 \div 5$ or 9 square metres.

- Since $45 \div 9 = 5$, one 5 litre can and one litre of paint are needed.

EXERCISES Find the amount of paint required for these jobs and the cost of the paint. A 5 litre can will cover 40 square metres and costs \$16.95. A litre of paint costs \$3.89.

1. The wall of a family room that is 7.2×2.4 metres. Two coats are to be applied.
1.5 litre can; \$16.95
2. The exterior of a house that has 142 square metres to be covered. Two coats are to be applied.
7.5 litre cans and 1 litre; \$122.54
3. A fence that is 18 metres long and 1.20 metres high is to be covered with one coat on each side.
1.5 litre can and 1 litre; \$20.84
4. A rectangular-shaped room 3.60×4.80 metres with 2.40 metre high walls. The ceiling is to be painted, but a door $75 \text{ cm} \times 200 \text{ cm}$ and a closet door $80 \text{ cm} \times 200 \text{ cm}$ are not to be painted.
1.5 litre can and 2 litres; \$24.73
5. A pantry that is 4.20 square metres with 2.40 metre high walls. The ceiling is to be painted, but a door $75 \text{ cm} \times 200 \text{ cm}$, and built-in closet doors 5.4 square metres are not to be painted.
1.5 litre can and 2 litres; \$24.73

Project: Find the difference in cost between buying a finished piece of furniture and buying the furniture unfinished and finishing it yourself

PROBLEMS

1. Orysia Bourak selected hardwood paneling for her home. Compute the cost.

Quantity	Description	Price per Sq. Metre	Amount
28 sq. metres	Birch	\$5.25	\$147.00
22 sq. metres	Elm	\$5.85	\$128.70
36 sq. metres	Walnut	\$10.35	\$372.60
41 sq. metres	Oak	\$6.25	\$256.25

2. Anna and Alex Hucajluk have a patio that is 7.5 metres square. They wish to cover the patio with concrete 10 cm deep. If wet, ready-mixed concrete is \$26.95 per cubic metre delivered, find the cost of the concrete. **\$151.59**
3. Irene and Jura Bilaniuk have a patio that is 5 x 8 metres. They wish to cover the patio with red bricks. If the bricks are priced at \$155 per M, find the cost of the bricks to cover the patio. **\$310.00**
4. Georgina and John Gilbert are going to paint the exterior of their home. The paint they have chosen costs \$12.95 a 5 litre can, \$3.10 a litre. The base of the house is a rectangle 14×11 metres. The height of the walls is 2.4 metres from the foundation to the roof. A 5 litre can of paint will cover 45 square metres. Find the cost of paint to do the job. **2, 5 litre cans + 4 litres; \$38.30**

QUESTIONS

- How are the prices of hardwood paneling quoted?
- What is the standard height of a wall in the home?
- How is the price of wet, ready-mixed concrete quoted?
- How many cubic centimetres are there in a cubic metre?
- What are the different ways in which concrete may be purchased for a job?
- What materials are in concrete?
- How is the price of bricks quoted?
- What are the two most common ways in which bricks are laid?
- How many square centimetres are there in the face of a brick if you construct a patio?
- How many square centimetres are there in the face of brick when they are stacked?
- How many square metres will a 5 litre can of paint usually cover?
- Why are rubber-based paints easy to use?

APPENDIX

TABLE I Compound Interest

Period	1 ¹ / ₄ %	1 ¹ / ₂ %	1 ³ / ₄ %	2%	2 ¹ / ₂ %	3%
1	1.012500	1.015000	1.017500	1.020000	1.025000	1.030000
2	1.025156	1.030225	1.035306	1.040400	1.050625	1.060900
3	1.037970	1.045678	1.053424	1.061208	1.076891	1.092727
4	1.050945	1.061363	1.071859	1.082432	1.103813	1.125509
5	1.064082	1.077283	1.090617	1.104081	1.131408	1.159274
6	1.077383	1.093442	1.109703	1.126163	1.159693	1.194052
7	1.090850	1.109844	1.129123	1.148686	1.188685	1.229874
8	1.104486	1.126492	1.148883	1.171660	1.218402	1.266770
9	1.118292	1.143389	1.168988	1.195039	1.248862	1.304773
10	1.132271	1.160540	1.189445	1.218995	1.280084	1.343916
11	1.146424	1.177948	1.210260	1.243375	1.312086	1.384233
12	1.160754	1.195617	1.231440	1.268243	1.344888	1.425760
13	1.175263	1.213551	1.252990	1.293608	1.378510	1.468533
14	1.189954	1.231754	1.274917	1.319480	1.412973	1.512589
15	1.204828	1.250230	1.297228	1.345870	1.448297	1.557967
16	1.219888	1.268983	1.319929	1.372787	1.484504	1.604706
17	1.235137	1.288018	1.343028	1.400243	1.521617	1.652847
18	1.250576	1.307338	1.366531	1.428248	1.559657	1.702432
19	1.266208	1.326948	1.390445	1.456813	1.598648	1.753505
20	1.282036	1.346852	1.414778	1.485949	1.638614	1.806110
21	1.298061	1.367055	1.439537	1.515668	1.679579	1.860293
22	1.314287	1.387561	1.464729	1.545981	1.721568	1.916102
23	1.330716	1.408374	1.490362	1.576901	1.764607	1.973585
24	1.347350	1.429500	1.516443	1.608439	1.808722	2.032793
25	1.364192	1.450943	1.542981	1.640608	1.853940	2.093777
26	1.381244	1.472707	1.569983	1.673420	1.900289	2.156590
27	1.398510	1.494798	1.597458	1.706888	1.947796	2.221288
28	1.415991	1.517220	1.625414	1.741026	1.996491	2.287927
29	1.433691	1.539978	1.653859	1.775847	2.046403	2.356565
30	1.451612	1.563078	1.682802	1.811364	2.097563	2.427262
31	1.469757	1.586524	1.712251	1.847591	2.150002	2.500080
32	1.488129	1.610322	1.742215	1.884543	2.203752	2.575082
33	1.506731	1.634477	1.772704	1.922234	2.258846	2.652334
34	1.525565	1.658994	1.803726	1.960679	2.315317	2.731904
35	1.544635	1.683879	1.835291	1.999893	2.373200	2.813861
36	1.563943	1.709137	1.867409	2.039891	2.432530	2.898277
37	1.583492	1.734774	1.900089	2.080689	2.493343	2.985225
38	1.603286	1.760796	1.933341	2.122303	2.555677	3.074782
39	1.623327	1.787208	1.967174	2.164749	2.619569	3.167025
40	1.643619	1.814016	2.001600	2.208044	2.685058	3.262036
41	1.664164	1.841226	2.036628	2.252205	2.752184	3.359897
42	1.684966	1.868844	2.072269	2.297249	2.820989	3.460694
43	1.706028	1.896877	2.108534	2.343194	2.891514	3.564515
44	1.727353	1.925330	2.145433	2.390058	2.963802	3.671450
45	1.748945	1.954210	2.182978	2.437859	3.037897	3.781594
46	1.770807	1.983523	2.221180	2.486616	3.113844	3.895042
47	1.792942	2.013276	2.260051	2.536348	3.191690	4.011893
48	1.815354	2.043475	2.299602	2.587075	3.271482	4.132250
49	1.838046	2.074127	2.339845	2.638817	3.353269	4.256218
50	1.861022	2.105239	2.380792	2.691593	3.437101	4.383905

TABLE I, continued

Period	1 ¹ / ₄ %	1 ¹ / ₂ %	1 ³ / ₄ %	2%	2 ¹ / ₂ %	3%
51	1.884285	2.136818	2.422456	2.745425	3.523029	4.515422
52	1.907839	2.168870	2.464849	2.800334	3.611105	4.650885
53	1.931687	2.201403	2.507984	2.856341	3.701383	4.790412
54	1.955833	2.234424	2.551874	2.913468	3.793918	4.934124
55	1.980281	2.267940	2.596532	2.971737	3.888766	5.082148
56	2.005035	2.301959	2.641971	3.031172	3.985985	5.234612
57	2.030098	2.336488	2.688205	3.091795	4.085635	5.391650
58	2.055474	2.371535	2.735249	3.153631	4.187776	5.553400
59	2.081167	2.407108	2.783116	3.216704	4.292470	5.720002
60	2.107182	2.443215	2.831821	3.281038	4.399782	5.891602
61	2.133522	2.479863	2.881378	3.346659	4.509777	6.068350
62	2.160191	2.517061	2.931802	3.413592	4.622521	6.250401
63	2.187193	2.554817	2.983109	3.481864	4.738084	6.437913
64	2.214533	2.593139	3.035313	3.551501	4.856536	6.631050
65	2.242215	2.632036	3.088431	3.622531	4.977949	6.829982
66	2.270243	2.671517	3.142479	3.694982	5.102398	7.034881
67	2.298621	2.711590	3.197472	3.768882	5.229958	7.245927
68	2.327354	2.752264	3.253428	3.844260	5.360707	7.463305
69	2.356446	2.793548	3.310363	3.921145	5.494725	7.687204
70	2.385902	2.835451	3.368294	3.999568	5.632093	7.917820
71	2.415726	2.877983	3.427239	4.079559	5.772895	8.155355
72	2.445923	2.921153	3.487216	4.161150	5.917217	8.400016
73	2.476497	2.964970	3.548242	4.244373	6.065147	8.652016
74	2.507453	3.009445	3.610336	4.329260	6.216776	8.911576
75	2.538796	3.054587	3.673517	4.415845	6.372195	9.178923
76	2.570531	3.100406	3.737804	4.504162	6.531500	9.454291
77	2.602663	3.146912	3.803216	4.594245	6.694788	9.737920
78	2.635196	3.194116	3.869772	4.686130	6.862158	10.030058
79	2.668136	3.242028	3.937493	4.779853	7.033712	10.330960
80	2.701488	3.290658	4.006399	4.875450	7.209555	10.640889
81	2.735257	3.340018	4.076511	4.972959	7.389794	10.960116
82	2.769448	3.390118	4.147850	5.072418	7.574539	11.288919
83	2.804066	3.440970	4.220437	5.173866	7.763902	11.627587
84	2.839117	3.492585	4.294295	5.277343	7.958000	11.976415
85	2.874606	3.544974	4.369445	5.382890	8.156950	12.335707
86	2.910539	3.598149	4.445910	5.490548	8.360874	12.705778
87	2.946921	3.652121	4.523713	5.600359	8.569896	13.086951
88	2.983758	3.706903	4.602878	5.712366	8.784143	13.479560
89	3.021055	3.762507	4.683428	5.826613	9.003747	13.883947
90	3.058818	3.818945	4.765388	5.943145	9.228841	14.300465
91	3.097053	3.876229	4.848782	6.062008	9.459562	14.729479
92	3.135766	3.934372	4.933636	6.183248	9.696051	15.171363
93	3.174963	3.993388	5.019975	6.306913	9.938452	15.626504
94	3.214650	4.053289	5.107825	6.433051	10.186913	16.095299
95	3.254833	4.114088	5.197212	6.561712	10.441586	16.578158
96	3.295518	4.175799	5.288163	6.692946	10.702626	17.075503
97	3.336712	4.238436	5.380706	6.826805	10.970192	17.587768
98	3.378421	4.302013	5.474868	6.963341	11.244447	18.115401
99	3.420651	4.366543	5.570678	7.102808	11.525558	18.658863
100	3.463409	4.432041	5.668165	7.244660	11.813697	19.218629

TABLE I, continued

Period	3½%	4%	5%	6%	7%	8%
1	1.035000	1.040000	1.050000	1.060000	1.070000	1.080000
2	1.071225	1.081600	1.102500	1.123600	1.144900	1.166400
3	1.108718	1.124864	1.157625	1.191016	1.225043	1.259712
4	1.147523	1.169859	1.215506	1.262477	1.310796	1.360489
5	1.187686	1.216653	1.276281	1.338226	1.402552	1.469328
6	1.229255	1.265319	1.340095	1.418520	1.500731	1.586874
7	1.272279	1.315832	1.407100	1.503631	1.605782	1.713824
8	1.316809	1.368569	1.477455	1.593849	1.718187	1.850930
9	1.362897	1.423312	1.551328	1.689480	1.838460	1.999004
10	1.410598	1.480244	1.628894	1.790849	1.967152	2.158924
11	1.459969	1.539454	1.710339	1.898300	2.104853	2.331638
12	1.511068	1.601032	1.795856	2.012198	2.252193	2.518169
13	1.563955	1.665073	1.885649	2.132930	2.409847	2.719623
14	1.618693	1.731676	1.979931	2.260906	2.578536	2.937193
15	1.675347	1.800943	2.078928	2.396560	2.759034	3.172168
16	1.733984	1.872981	2.182874	2.540354	2.952166	3.425941
17	1.794673	1.947900	2.292018	2.692775	3.158818	3.700016
18	1.857487	2.025816	2.406619	2.854342	3.379935	3.996017
19	1.922499	2.106849	2.526950	3.025603	3.616530	4.315698
20	1.989786	2.191123	2.653298	3.207139	3.869687	4.660954
21	2.059429	2.278768	2.785963	3.399567	4.140565	5.033830
22	2.131509	2.369919	2.925261	3.603541	4.430405	5.436536
23	2.206112	2.464716	3.071524	3.819753	4.740533	5.871459
24	2.283326	2.563305	3.225100	4.048938	5.072370	6.341176
25	2.363242	2.665837	3.386355	4.291874	5.427436	6.848470
26	2.445955	2.772470	3.555673	4.549386	5.807357	7.396348
27	2.531563	2.883369	3.733457	4.822349	6.213872	7.988056
28	2.620168	2.998704	3.920130	5.111690	6.648843	8.627100
29	2.711874	3.118652	4.116137	5.418391	7.114262	9.317268
30	2.806790	3.243395	4.321944	5.743494	7.612260	10.062649
31	2.905028	3.373134	4.538041	6.088104	8.145118	10.867661
32	3.006704	3.508059	4.764943	6.453390	8.715276	11.737074
33	3.111939	3.648381	5.003190	6.840593	9.325345	12.676040
34	3.220857	3.794316	5.253350	7.251029	9.978119	13.690123
35	3.333587	3.946089	5.516018	7.686091	10.676587	14.785333
36	3.450263	4.103933	5.791819	8.147256	11.423948	15.968160
37	3.571022	4.268090	6.081410	8.630691	12.223624	17.245613
38	3.696008	4.438814	6.385481	9.154256	13.079278	18.625262
39	3.825368	4.616367	6.704755	9.703511	13.994827	20.115283
40	3.959256	4.801022	7.039993	10.285722	14.974465	21.724506
41	4.097830	4.993063	7.391993	10.902865	16.022678	23.462466
42	4.241254	5.192786	7.761593	11.557037	17.144265	25.339463
43	4.389698	5.400497	8.149673	12.250459	18.344364	27.366620
44	4.543337	5.616517	8.557157	12.985487	19.628469	29.555950
45	4.702354	5.841178	8.985015	13.764616	21.002462	31.920426
46	4.866936	6.074825	9.434266	14.590493	22.472634	34.474060
47	5.037279	6.317818	9.905979	15.465923	24.045718	37.231985
48	5.213584	6.570531	10.401278	16.393878	25.728918	40.210544
49	5.396059	6.833352	10.921342	17.377511	27.529942	43.427388
50	5.584921	7.106686	11.467409	18.420162	29.457038	46.901579

TABLE I, continued

Period	3½%	4%	5%	6%	7%	8%
51	5.780393	7.390953	12.040779	19.525372	31.519031	50.653705
52	5.982707	7.686591	12.642818	20.696894	33.725363	54.706001
53	6.192102	7.994055	13.274959	21.936708	36.086138	59.082481
54	6.408826	8.313817	13.938707	23.255030	38.612168	63.809079
55	6.633135	8.646370	14.635642	24.650332	41.315020	68.913805
56	6.865295	8.992225	15.367424	26.129352	44.207071	74.426909
57	7.105580	9.351914	16.135795	27.697113	47.301566	80.381062
58	7.354275	9.725991	16.942585	29.358940	50.612676	86.811547
59	7.611675	10.115031	17.789714	31.120476	54.155563	93.756471
60	7.878084	10.519632	18.679200	32.987705	57.946452	101.256989
61	8.153817	10.940417	19.613160	34.966967	62.002704	109.357548
62	8.439201	11.378034	20.593818	37.064985	66.342893	118.106152
63	8.734573	11.833155	21.623509	39.288884	70.986896	127.554644
64	9.040283	12.306481	22.704684	41.646217	75.955979	137.759016
65	9.356693	12.798740	23.839918	44.144990	81.272898	148.779737
66	9.684177	13.310690	25.031914	46.793689	86.962001	160.682116
67	10.023123	13.843118	26.283510	49.601310	93.049341	173.536685
68	10.373932	14.396843	27.597686	52.577389	99.562795	187.419620
69	10.737020	14.972717	28.977570	55.732032	106.532191	202.413190
70	11.112816	15.571626	30.426449	59.075954	113.989444	218.606245
71	11.501765	16.194491	31.947771	62.620511	121.968705	236.094745
72	11.904327	16.842271	33.545160	66.377742	130.506514	254.982325
73	12.320978	17.515962	35.222418	70.360407	139.641970	275.380911
74	12.752212	18.216600	36.983539	74.582031	149.416908	297.411384
75	13.198539	18.945264	38.832716	79.056953	159.876092	321.204295
76	13.660488	19.703075	40.774352	83.800370	171.067418	346.900639
77	14.138605	20.491198	42.813070	88.828392	183.042137	374.652690
78	14.633456	21.310846	44.953724	94.158096	195.855087	404.624905
79	15.145627	22.163280	47.201410	99.807582	209.564943	436.994897
80	15.675724	23.049811	49.561481	105.796037	224.234489	471.954489
81	16.224374	23.971803	52.039555	112.143799	239.930903	509.710848
82	16.792227	24.930675	54.641533	118.872427	256.726066	550.487716
83	17.379955	25.927902	57.373610	126.004773	274.696891	594.526733
84	17.988253	26.965018	60.242291	133.565059	293.925673	642.088872
85	18.617842	28.043619	63.254406	141.578963	314.500470	693.455982
86	19.269466	29.165364	66.417126	150.073701	336.515503	748.932461
87	19.943897	30.331979	69.737982	159.078123	360.071588	808.847058
88	20.641933	31.545258	73.224881	168.622810	385.276599	873.554823
89	21.364401	32.807068	76.886125	178.740179	412.245961	943.439209
90	22.112155	34.119351	80.730431	189.464590	441.103178	1018.914346
91	22.886080	35.484125	84.766953	200.832465	471.980400	1100.427494
92	23.687093	36.903490	89.005301	212.882413	505.019028	1188.461694
93	24.516141	38.379630	93.455566	225.655358	540.370360	1283.538630
94	25.374206	39.914815	98.128344	239.194679	578.196285	1386.221720
95	26.262303	41.511408	103.034761	253.546360	618.670025	1497.119458
96	27.181484	43.171864	108.186499	268.759142	661.976927	1616.889015
97	28.132836	44.898739	113.595824	284.884691	708.315312	1746.240136
98	29.117485	46.694689	119.275615	301.977772	757.897384	1885.939347
99	30.136597	48.562477	125.239396	320.096438	810.950201	2036.814495
100	31.191378	50.504976	131.501366	339.302224	867.716715	2199.759655

TABLE II Present Value

Period	1¼%	1½%	1¾%	2%	2½%	3%
1	.987654	.985221	.982801	.980392	.975609	.970873
2	.975461	.970661	.965898	.961168	.951814	.942595
3	.963419	.956316	.949285	.942322	.928599	.915141
4	.951525	.942184	.932959	.923845	.905950	.888487
5	.939777	.928260	.916912	.905730	.883854	.862608
6	.928175	.914542	.901142	.887971	.862296	.837484
7	.916716	.901026	.885643	.870560	.841265	.813091
8	.905399	.887711	.870411	.853490	.820746	.789409
9	.894221	.874592	.855441	.836755	.800728	.766416
10	.883181	.861667	.840728	.820348	.781198	.744093
11	.872278	.848933	.826269	.804263	.762144	.722421
12	.861509	.836387	.812057	.788493	.743555	.701379
13	.850873	.824027	.798091	.773032	.725420	.680951
14	.840369	.811849	.784365	.757875	.707727	.661117
15	.829994	.799851	.770875	.743014	.690465	.641861
16	.819747	.788031	.757617	.728445	.673624	.623166
17	.809627	.776385	.744586	.714162	.657195	.605016
18	.799632	.764911	.731780	.700159	.641165	.587394
19	.789760	.753607	.719194	.686430	.625527	.570286
20	.780009	.742470	.706825	.672971	.610270	.553675
21	.770380	.731497	.694668	.659775	.595386	.537549
22	.760869	.720687	.682720	.646839	.580864	.521892
23	.751475	.710037	.670978	.634155	.566697	.506691
24	.742198	.699543	.659438	.621721	.552875	.491933
25	.733035	.689205	.648096	.609530	.539390	.477605
26	.723985	.679020	.636950	.597579	.526234	.463694
27	.715047	.668985	.625995	.585862	.513399	.450189
28	.706219	.659099	.615228	.574374	.500877	.437076
29	.697500	.649358	.604646	.563112	.488661	.424346
30	.688889	.639762	.594247	.552070	.476742	.411986
31	.680385	.630307	.584027	.541245	.465114	.399987
32	.671985	.620992	.573982	.530633	.453770	.388337
33	.663688	.611815	.564110	.520228	.442702	.377026
34	.655495	.602774	.554408	.510028	.431905	.366044
35	.647402	.593866	.544873	.500027	.421371	.355383
36	.639409	.585089	.535501	.490223	.411093	.345032
37	.631516	.576443	.526291	.480610	.401067	.334982
38	.623719	.567924	.517239	.471187	.391284	.325226
39	.616019	.559531	.508343	.461948	.381741	.315753
40	.608414	.551262	.499600	.452890	.372430	.306556
41	.600902	.543115	.491008	.444010	.363346	.297628
42	.593484	.535089	.482563	.435304	.354484	.288959
43	.586157	.527181	.474263	.426768	.345838	.280542
44	.578920	.519390	.466106	.418400	.337403	.272371
45	.571773	.511714	.458090	.410196	.329174	.264438
46	.564714	.504152	.450211	.402153	.321145	.256736
47	.557743	.496702	.442468	.394268	.313312	.249258
48	.550857	.489361	.434858	.386537	.305671	.241998
49	.544056	.482129	.427379	.378958	.298215	.234950
50	.537339	.475004	.420028	.371527	.290942	.228107

TABLE II, continued

Period	1¼%	1½%	1¾%	2%	2½%	3%
51	.530705	.467984	.412804	.364243	.283846	.221463
52	.524153	.461068	.405704	.357101	.276923	.215012
53	.517682	.454255	.398727	.350099	.270168	.208750
54	.511291	.447541	.391869	.343234	.263579	.202670
55	.504979	.440928	.385129	.336504	.257150	.196767
56	.498744	.434411	.378505	.329906	.250878	.191036
57	.492587	.427991	.371995	.323437	.244759	.185471
58	.486506	.421666	.365597	.317095	.238789	.180069
59	.480500	.415435	.359309	.310877	.232965	.174825
60	.474567	.409295	.353130	.304782	.227283	.169733
61	.468709	.403247	.347056	.298806	.221740	.164789
62	.462922	.397287	.341087	.292947	.216331	.159989
63	.457207	.391416	.335221	.287203	.211055	.155329
64	.451562	.385632	.329455	.281571	.205907	.150805
65	.445988	.379933	.323789	.276050	.200885	.146413
66	.440481	.374318	.318220	.270637	.195985	.142148
67	.435043	.368786	.312747	.265331	.191205	.138008
68	.429672	.363336	.307368	.260128	.186542	.133988
69	.424368	.357967	.302082	.255028	.181992	.130086
70	.419129	.352676	.296886	.250027	.177553	.126297
71	.413954	.347464	.291780	.245125	.173223	.122618
72	.408844	.342330	.286762	.240318	.168998	.119047
73	.403796	.337270	.281830	.235606	.164876	.115579
74	.398811	.332286	.276983	.230986	.160854	.112213
75	.393887	.327376	.272219	.226457	.156931	.108945
76	.389025	.322537	.267537	.222017	.153103	.105772
77	.384222	.317771	.262935	.217664	.149369	.102691
78	.379478	.313075	.258413	.213396	.145726	.099700
79	.374793	.308448	.253969	.209211	.142172	.096796
80	.370166	.303890	.249601	.205109	.138704	.093977
81	.365596	.299399	.245308	.201087	.135321	.091239
82	.361083	.294974	.241089	.197145	.132021	.088582
83	.356625	.290615	.236942	.193279	.128800	.086002
84	.352222	.286320	.232867	.189489	.125659	.083497
85	.347874	.282089	.228862	.185774	.122594	.081065
86	.343579	.277920	.224926	.182131	.119604	.078704
87	.339337	.273813	.221057	.178560	.116687	.076411
88	.335148	.269766	.217255	.175059	.113841	.074186
89	.331010	.265779	.213519	.171626	.111064	.072025
90	.326924	.261852	.209847	.168261	.108355	.069927
91	.322888	.257982	.206237	.164962	.105712	.067891
92	.318901	.254169	.202690	.161727	.103134	.065913
93	.314964	.250413	.199204	.158556	.100619	.063993
94	.311076	.246713	.195778	.155447	.098165	.062129
95	.307235	.243067	.192411	.152399	.095770	.060320
96	.303442	.239474	.189102	.149411	.093434	.058563
97	.299696	.235935	.185849	.146481	.091155	.056857
98	.295996	.232449	.182653	.143609	.088932	.055201
99	.292342	.229013	.179511	.140793	.086763	.053593
100	.288733	.225629	.176424	.138032	.084647	.052032

TABLE II, continued

Period	3½%	4%	5%	6%	7%	8%
1	.966183	.961538	.952380	.943396	.934579	.925925
2	.933510	.924556	.907029	.889996	.873438	.857338
3	.901942	.888996	.863837	.839619	.816297	.793832
4	.871442	.854804	.822702	.792093	.762895	.735029
5	.841973	.821927	.783526	.747258	.712986	.680583
6	.813500	.790314	.746215	.704960	.666342	.630169
7	.785990	.759917	.710681	.665057	.622749	.583490
8	.759411	.730690	.676839	.627412	.582009	.540268
9	.733731	.702586	.644608	.591898	.543933	.500248
10	.708918	.675564	.613913	.558394	.508349	.463193
11	.684945	.649580	.584679	.526787	.475092	.428882
12	.661783	.624597	.556837	.496969	.444011	.397113
13	.639404	.600574	.530321	.468839	.414964	.367697
14	.617781	.577475	.505067	.442300	.387817	.340461
15	.596890	.555264	.481017	.417265	.362446	.315241
16	.576705	.533908	.458111	.393646	.338734	.291890
17	.557203	.513373	.436296	.371364	.316574	.270268
18	.538361	.493628	.415520	.350343	.295863	.250249
19	.520155	.474642	.395733	.330512	.276508	.231712
20	.502565	.456386	.376889	.311804	.258418	.214548
21	.485570	.438833	.358942	.294155	.241513	.198655
22	.469150	.421955	.341849	.277505	.225713	.183940
23	.453285	.405726	.325571	.261797	.210946	.170315
24	.437957	.390121	.310067	.246978	.197146	.157699
25	.423147	.375116	.295302	.232998	.184249	.146017
26	.408837	.360689	.281240	.219810	.172195	.135201
27	.395012	.346816	.267848	.207367	.160930	.125186
28	.381654	.333477	.255093	.195630	.150402	.115913
29	.368748	.320651	.242946	.184556	.140562	.107327
30	.356278	.308318	.231377	.174110	.131367	.099377
31	.344230	.296460	.220359	.164254	.122773	.092016
32	.332589	.285057	.209866	.154957	.114741	.085200
33	.321342	.274094	.199872	.146186	.107234	.078888
34	.310476	.263552	.190354	.137911	.100219	.073045
35	.299976	.253415	.181290	.130105	.093662	.067634
36	.289832	.243668	.172657	.122740	.087535	.062624
37	.280031	.234296	.164435	.115793	.081808	.057985
38	.270561	.225285	.156605	.109238	.076456	.053690
39	.261412	.216620	.149147	.103055	.071455	.049713
40	.252572	.208289	.142045	.097222	.066780	.046030
41	.244031	.200277	.135281	.091719	.062411	.042621
42	.235779	.192574	.128639	.086527	.058328	.039464
43	.227805	.185168	.122704	.081629	.054512	.036540
44	.220102	.178046	.116861	.077009	.050946	.033834
45	.212659	.171198	.111296	.072650	.047613	.031327
46	.205467	.164613	.105996	.068537	.044498	.029007
47	.198519	.158282	.100949	.064658	.041587	.026858
48	.191806	.152194	.096142	.060998	.038866	.024869
49	.185320	.146341	.091563	.057545	.036324	.023026
50	.179053	.140712	.087203	.054288	.033947	.021321

TABLE II, continued

Period	3½%	4%	5%	6%	7%	8%
51	.172998	.135300	.083051	.051215	.031726	.019741
52	.167148	.130096	.079096	.048316	.029651	.018279
53	.161495	.125093	.075329	.045581	.027711	.016925
54	.156034	.120281	.071742	.043001	.025898	.015671
55	.150758	.115655	.068326	.040567	.024204	.014510
56	.145660	.111207	.065072	.038271	.022620	.013435
57	.140734	.106930	.061974	.036104	.021140	.012440
58	.135975	.102817	.059022	.034061	.019757	.011519
59	.131377	.098862	.056212	.032133	.018465	.010665
60	.126934	.095060	.053535	.030314	.017257	.009875
61	.122641	.091404	.050986	.028598	.016128	.009144
62	.118494	.087888	.048558	.026979	.015073	.008466
63	.114487	.084508	.046245	.025452	.014087	.007839
64	.110615	.081258	.044043	.024011	.013165	.007259
65	.106875	.078132	.041946	.022652	.012304	.006721
66	.103261	.075127	.039949	.021370	.011499	.006223
67	.099769	.072238	.038046	.020160	.010746	.005762
68	.096395	.069459	.036234	.019019	.010043	.005335
69	.093135	.066788	.034509	.017943	.009386	.004940
70	.089986	.064219	.032866	.016827	.008772	.004574
71	.086943	.061749	.031301	.015969	.008198	.004235
72	.084003	.059374	.029810	.015065	.007662	.003921
73	.081162	.057090	.028391	.014212	.007161	.003631
74	.078417	.054895	.027039	.013408	.006692	.003362
75	.075765	.052783	.025751	.012649	.006254	.003113
76	.073203	.050753	.024525	.011933	.005845	.002882
77	.070728	.048801	.023357	.011257	.005463	.002669
78	.068336	.046924	.022245	.010620	.005105	.002471
79	.066025	.045119	.021185	.010019	.004771	.002288
80	.063792	.043384	.020176	.009452	.004459	.002118
81	.061635	.041715	.019216	.008917	.004167	.001961
82	.059551	.040111	.018301	.008412	.003895	.001816
83	.057537	.038568	.017429	.007936	.003640	.001682
84	.055591	.037085	.016599	.007486	.003402	.001557
85	.053711	.035658	.015809	.007063	.003179	.001442
86	.051895	.034287	.015056	.006663	.002971	.001335
87	.050140	.032968	.014339	.006286	.002777	.001236
88	.048445	.031700	.013656	.005930	.002595	.001144
89	.046806	.030481	.013006	.005594	.002425	.001059
90	.045223	.029308	.012386	.005278	.002267	.000981
91	.043694	.028181	.011797	.004979	.002118	.000908
92	.042217	.027097	.011235	.004697	.001980	.000841
93	.040789	.026055	.010700	.004431	.001850	.000779
94	.039410	.025053	.010190	.004180	.001729	.000721
95	.038077	.024089	.009705	.003944	.001616	.000667
96	.036789	.023163	.009243	.003720	.001510	.000618
97	.035545	.022272	.008803	.003510	.001411	.000572
98	.034343	.021415	.008383	.003311	.001319	.000530
99	.033182	.020592	.007984	.003124	.001233	.000490
100	.032060	.019800	.007604	.002947	.001152	.000454

TABLE III Amortization

Period	1/2%	1 1/4%	1 1/2%	1 3/4%	2%	2 1/2%
1	1.005000	1.012500	1.015000	1.017500	1.020000	1.025000
2	.503753	.509399	.511277	.513166	.515049	.518827
3	.336674	.341707	.343385	.345068	.346754	.350135
4	.253138	.257862	.259446	.261032	.262624	.265817
5	.203011	.207562	.209091	.210620	.212158	.215247
6	.169598	.174034	.175527	.177021	.178525	.181550
7	.145730	.150089	.151557	.153029	.154511	.157495
8	.127828	.132133	.133584	.135041	.136509	.139467
9	.113906	.118170	.119610	.121057	.122515	.125457
10	.102768	.107002	.108434	.109875	.111326	.114258
11	.093657	.097868	.099294	.100730	.102177	.105106
12	.086064	.090258	.091680	.093113	.094559	.097487
13	.079641	.083821	.085240	.086672	.088118	.091048
14	.074135	.078305	.079723	.081155	.082601	.085536
15	.069363	.073526	.074944	.076377	.077825	.080766
16	.065188	.069347	.070765	.072199	.073649	.076599
17	.061505	.065660	.067080	.068516	.069969	.072927
18	.058231	.062385	.063806	.065244	.066701	.069670
19	.055302	.059455	.060878	.062320	.063781	.066760
20	.052666	.056820	.058246	.059691	.061156	.064147
21	.050281	.054437	.055865	.057314	.058784	.061787
22	.048113	.052272	.053703	.055156	.056631	.059646
23	.046134	.050296	.051731	.053187	.054667	.057696
24	.044320	.048486	.049924	.051385	.052871	.055912
25	.042651	.046822	.048263	.049729	.051220	.054276
26	.041111	.045287	.046732	.048202	.049699	.052768
27	.039685	.043866	.045315	.046790	.048293	.051376
28	.038361	.042548	.044001	.045481	.046989	.050088
29	.037129	.041322	.042778	.044264	.045778	.048891
30	.035978	.040178	.041639	.043129	.044649	.047777
31	.034903	.039109	.040574	.042069	.043596	.046739
32	.033894	.038107	.039577	.041078	.042610	.045768
33	.032947	.037167	.038641	.040147	.041686	.044859
34	.032055	.036283	.037761	.039273	.040818	.044006
35	.031215	.035451	.036933	.038450	.040002	.043205
36	.030421	.034665	.036152	.037675	.039232	.042451
37	.029671	.033922	.035414	.036942	.038506	.041740
38	.028960	.033219	.034716	.036249	.037820	.041070
39	.028286	.032553	.034054	.035593	.037171	.040436
40	.027645	.031921	.033427	.034972	.036555	.039836
41	.027036	.031320	.032831	.034381	.035971	.039267
42	.026456	.030749	.032264	.033820	.035417	.038728
43	.025903	.030204	.031724	.033286	.034889	.038216
44	.025375	.029685	.031210	.032778	.034387	.037730
45	.024871	.029190	.030719	.032293	.033909	.037267
46	.024389	.028716	.030251	.031830	.033453	.036826
47	.023927	.028264	.029803	.031388	.033017	.036406
48	.023485	.027830	.029375	.030965	.032601	.036006
49	.023060	.027415	.028964	.030561	.032203	.035623
50	.022653	.027017	.028571	.030173	.031823	.035258

TABLE III, continued

Period	1/2%	1 1/4%	1 1/2%	1 3/4%	2%	2 1/2%
51	.022262	.026635	.028194	.029802	.031458	.034908
52	.021886	.026268	.027832	.029446	.031109	.034574
53	.021525	.025916	.027485	.029104	.030773	.034254
54	.021176	.025577	.027151	.028776	.030452	.033948
55	.020841	.025251	.026830	.028461	.030143	.033654
56	.020518	.024937	.026521	.028157	.029846	.033372
57	.020206	.024634	.026223	.027866	.029561	.033102
58	.019904	.024343	.025936	.027585	.029286	.032842
59	.019614	.024061	.025660	.027314	.029022	.032593
60	.019332	.023789	.025393	.027053	.028767	.032353
61	.019061	.023527	.025136	.026801	.028522	.032122
62	.018798	.023274	.024887	.026558	.028286	.031901
63	.018543	.023029	.024647	.026324	.028058	.031687
64	.018296	.022792	.024415	.026098	.027838	.031482
65	.018058	.022562	.024190	.025879	.027626	.031284
66	.017826	.022340	.023973	.025668	.027421	.031093
67	.017601	.022125	.023763	.025463	.027223	.030910
68	.017383	.021917	.023560	.025265	.027031	.030733
69	.017172	.021715	.023363	.025074	.026846	.030562
70	.016966	.021519	.023172	.024889	.026667	.030397
71	.016767	.021329	.022987	.024709	.026494	.030237
72	.016572	.021144	.022807	.024535	.026326	.030084
73	.016384	.020965	.022633	.024367	.026164	.029935
74	.016200	.020792	.022464	.024204	.026007	.029792
75	.016022	.020623	.022300	.024045	.025855	.029653
76	.015848	.020459	.022141	.023891	.025707	.029519
77	.015679	.020299	.021986	.023742	.025564	.029389
78	.015514	.020144	.021836	.023598	.025425	.029264
79	.015353	.019993	.021690	.023457	.025291	.029143
80	.015197	.019846	.021548	.023320	.025160	.029026
81	.015044	.019703	.021410	.023188	.025034	.028912
82	.014895	.019564	.021275	.023059	.024911	.028802
83	.014750	.019428	.021145	.022934	.024791	.028696
84	.014608	.019296	.021017	.022812	.024675	.028592
85	.014470	.019168	.020893	.022693	.024563	.028493
86	.014335	.019042	.020773	.022578	.024453	.028396
87	.014203	.018920	.020655	.022466	.024347	.028302
88	.014074	.018801	.020541	.022357	.024244	.028211
89	.013948	.018684	.020429	.022251	.024143	.028123
90	.013825	.018571	.020321	.022147	.024046	.028038
91	.013704	.018460	.020215	.022046	.023951	.027955
92	.013587	.018352	.020111	.021948	.023858	.027874
93	.013472	.018247	.020011	.021853	.023768	.027796
94	.013359	.018144	.019912	.021760	.023681	.027721
95	.013249	.018043	.019816	.021669	.023596	.027647
96	.013141	.017945	.019723	.021581	.023513	.027576
97	.013035	.017849	.019631	.021494	.023432	.027507
98	.012932	.017755	.019542	.021410	.023353	.027440
99	.012831	.017663	.019455	.021328	.023277	.027375
100	.012731	.017574	.019370	.021248	.023202	.027311

TABLE IV 5% Sales Tax

Transaction	Tax	Transaction	Tax	Transaction	Tax	Transaction	Tax	Transaction	Tax	Transaction	Tax
.01 - .10	.00	16.90 - 17.09	.85	33.90 - 34.09	1.70	50.90 - 51.09	2.55	67.90 - 68.09	3.40	84.90 - 85.09	4.25
.11 - .20	.01	17.10 - 17.29	.86	34.10 - 34.29	1.71	51.10 - 51.29	2.56	68.10 - 68.29	3.41	85.10 - 85.29	4.26
.21 - .30	.02	17.30 - 17.49	.87	34.30 - 34.49	1.72	51.30 - 51.49	2.57	68.30 - 68.49	3.42	85.30 - 85.49	4.27
.31 - .40	.03	17.50 - 17.69	.88	34.50 - 34.69	1.73	51.50 - 51.69	2.58	68.50 - 68.69	3.43	85.50 - 85.69	4.28
.41 - .50	.04	17.70 - 17.89	.89	34.70 - 34.89	1.74	51.70 - 51.89	2.59	68.70 - 68.89	3.44	85.70 - 85.89	4.29
.51 - .60	.05	17.90 - 18.09	.90	34.90 - 35.09	1.75	51.90 - 52.09	2.60	68.90 - 69.09	3.45	85.90 - 86.09	4.30
.61 - .70	.06	18.10 - 18.29	.91	35.10 - 35.29	1.76	52.10 - 52.29	2.61	69.10 - 69.29	3.46	86.10 - 86.29	4.31
.71 - .80	.07	18.30 - 18.49	.92	35.30 - 35.49	1.77	52.30 - 52.49	2.62	69.30 - 69.49	3.47	86.30 - 86.49	4.32
.81 - .90	.08	18.50 - 18.69	.93	35.50 - 35.69	1.78	52.50 - 52.69	2.63	69.50 - 69.69	3.48	86.50 - 86.69	4.33
.91 - 1.00	.09	18.70 - 18.89	.94	35.70 - 35.89	1.79	52.70 - 52.89	2.64	69.70 - 69.89	3.49	86.70 - 86.89	4.34
1.01 - 1.10	.10	18.90 - 19.09	.95	35.90 - 36.09	1.80	52.90 - 53.09	2.65	69.90 - 70.09	3.50	86.90 - 87.09	4.35
1.11 - 1.20	.11	19.10 - 19.29	.96	36.10 - 36.29	1.81	53.10 - 53.29	2.66	70.10 - 70.29	3.51	87.10 - 87.29	4.36
1.21 - 1.30	.12	19.30 - 19.49	.97	36.30 - 36.49	1.82	53.30 - 53.49	2.67	70.30 - 70.49	3.52	87.30 - 87.49	4.37
1.31 - 1.40	.13	19.50 - 19.69	.98	36.50 - 36.69	1.83	53.50 - 53.69	2.68	70.50 - 70.69	3.53	87.50 - 87.69	4.38
1.41 - 1.50	.14	19.70 - 19.89	.99	36.70 - 36.89	1.84	53.70 - 53.89	2.69	70.70 - 70.89	3.54	87.70 - 87.89	4.39
1.51 - 1.60	.15	19.90 - 20.09	1.00	36.90 - 37.09	1.85	53.90 - 54.09	2.70	70.90 - 71.09	3.55	87.90 - 88.09	4.40
1.61 - 1.70	.16	20.10 - 20.29	1.01	37.10 - 37.29	1.86	54.10 - 54.29	2.71	71.10 - 71.29	3.56	88.10 - 88.29	4.41
1.71 - 1.80	.17	20.30 - 20.49	1.02	37.30 - 37.49	1.87	54.30 - 54.49	2.72	71.30 - 71.49	3.57	88.30 - 88.49	4.42
1.81 - 1.90	.18	20.50 - 20.69	1.03	37.50 - 37.69	1.88	54.50 - 54.69	2.73	71.50 - 71.69	3.58	88.50 - 88.69	4.43
1.91 - 2.00	.19	20.70 - 20.89	1.04	37.70 - 37.89	1.89	54.70 - 54.89	2.74	71.70 - 71.89	3.59	88.70 - 88.89	4.44
2.01 - 2.10	.20	20.90 - 21.09	1.05	37.90 - 38.09	1.90	54.90 - 55.09	2.75	71.90 - 72.09	3.60	88.90 - 89.09	4.45
2.11 - 2.20	.21	21.10 - 21.29	1.06	38.10 - 38.29	1.91	55.10 - 55.29	2.76	72.10 - 72.29	3.61	89.10 - 89.29	4.46
2.21 - 2.30	.22	21.30 - 21.49	1.07	38.30 - 38.49	1.92	55.30 - 55.49	2.77	72.30 - 72.49	3.62	89.30 - 89.49	4.47
2.31 - 2.40	.23	21.50 - 21.69	1.08	38.50 - 38.69	1.93	55.50 - 55.69	2.78	72.50 - 72.69	3.63	89.50 - 89.69	4.48
2.41 - 2.50	.24	21.70 - 21.89	1.09	38.70 - 38.89	1.94	55.70 - 55.89	2.79	72.70 - 72.89	3.64	89.70 - 89.89	4.49
2.51 - 2.60	.25	21.90 - 22.09	1.10	38.90 - 39.09	1.95	55.90 - 56.09	2.80	72.90 - 73.09	3.65	89.90 - 90.09	4.50
2.61 - 2.70	.26	22.10 - 22.29	1.11	39.10 - 39.29	1.96	56.10 - 56.29	2.81	73.10 - 73.29	3.66	90.10 - 90.29	4.51
2.71 - 2.80	.27	22.30 - 22.49	1.12	39.30 - 39.49	1.97	56.30 - 56.49	2.82	73.30 - 73.49	3.67	90.30 - 90.49	4.52
2.81 - 2.90	.28	22.50 - 22.69	1.13	39.50 - 39.69	1.98	56.50 - 56.69	2.83	73.50 - 73.69	3.68	90.50 - 90.69	4.53
2.91 - 3.00	.29	22.70 - 22.89	1.14	39.70 - 39.89	1.99	56.70 - 56.89	2.84	73.70 - 73.89	3.69	90.70 - 90.89	4.54
3.01 - 3.10	.30	22.90 - 23.09	1.15	39.90 - 40.09	2.00	56.90 - 57.09	2.85	73.90 - 74.09	3.70	90.90 - 91.09	4.55
3.11 - 3.20	.31	23.10 - 23.29	1.16	40.10 - 40.29	2.01	57.10 - 57.29	2.86	74.10 - 74.29	3.71	91.10 - 91.29	4.56
3.21 - 3.30	.32	23.30 - 23.49	1.17	40.30 - 40.49	2.02	57.30 - 57.49	2.87	74.30 - 74.49	3.72	91.30 - 91.49	4.57
3.31 - 3.40	.33	23.50 - 23.69	1.18	40.50 - 40.69	2.03	57.50 - 57.69	2.88	74.50 - 74.69	3.73	91.50 - 91.69	4.58
3.41 - 3.50	.34	23.70 - 23.89	1.19	40.70 - 40.89	2.04	57.70 - 57.89	2.89	74.70 - 74.89	3.74	91.70 - 91.89	4.59
3.51 - 3.60	.35	23.90 - 24.09	1.20	40.90 - 41.09	2.05	57.90 - 58.09	2.90	74.90 - 75.09	3.75	91.90 - 92.09	4.60
3.61 - 3.70	.36	24.10 - 24.29	1.21	41.10 - 41.29	2.06	58.10 - 58.29	2.91	75.10 - 75.29	3.76	92.10 - 92.29	4.61
3.71 - 3.80	.37	24.30 - 24.49	1.22	41.30 - 41.49	2.07	58.30 - 58.49	2.92	75.30 - 75.49	3.77	92.30 - 92.49	4.62
3.81 - 3.90	.38	24.50 - 24.69	1.23	41.50 - 41.69	2.08	58.50 - 58.69	2.93	75.50 - 75.69	3.78	92.50 - 92.69	4.63
3.91 - 4.00	.39	24.70 - 24.89	1.24	41.70 - 41.89	2.09	58.70 - 58.89	2.94	75.70 - 75.89	3.79	92.70 - 92.89	4.64
4.01 - 4.10	.40	24.90 - 25.09	1.25	41.90 - 42.09	2.10	58.90 - 59.09	2.95	75.90 - 76.09	3.80	92.90 - 93.09	4.65
4.11 - 4.20	.41	25.10 - 25.29	1.26	42.10 - 42.29	2.11	59.10 - 59.29	2.96	76.10 - 76.29	3.81	93.10 - 93.29	4.66
4.21 - 4.30	.42	25.30 - 25.49	1.27	42.30 - 42.49	2.12	59.30 - 59.49	2.97	76.30 - 76.49	3.82	93.30 - 93.49	4.67
4.31 - 4.40	.43	25.50 - 25.69	1.28	42.50 - 42.69	2.13	59.50 - 59.69	2.98	76.50 - 76.69	3.83	93.50 - 93.69	4.68
4.41 - 4.50	.44	25.70 - 25.89	1.29	42.70 - 42.89	2.14	59.70 - 59.89	2.99	76.70 - 76.89	3.84	93.70 - 93.89	4.69
4.51 - 4.60	.45	25.90 - 26.09	1.30	42.90 - 43.09	2.15	59.90 - 60.09	3.00	76.90 - 77.09	3.85	93.90 - 94.09	4.70
4.61 - 4.70	.46	26.10 - 26.29	1.31	43.10 - 43.29	2.16	60.10 - 60.29	3.01	77.10 - 77.29	3.86	94.10 - 94.29	4.71
4.71 - 4.80	.47	26.30 - 26.49	1.32	43.30 - 43.49	2.17	60.30 - 60.49	3.02	77.30 - 77.49	3.87	94.30 - 94.49	4.72
4.81 - 4.90	.48	26.50 - 26.69	1.33	43.50 - 43.69	2.18	60.50 - 60.69	3.03	77.50 - 77.69	3.88	94.50 - 94.69	4.73
4.91 - 5.00	.49	26.70 - 26.89	1.34	43.70 - 43.89	2.19	60.70 - 60.89	3.04	77.70 - 77.89	3.89	94.70 - 94.89	4.74
5.01 - 5.10	.50	26.90 - 27.09	1.35	43.90 - 44.09	2.20	60.90 - 61.09	3.05	77.90 - 78.09	3.90	94.90 - 95.09	4.75
5.11 - 5.20	.51	27.10 - 27.29	1.36	44.10 - 44.29	2.21	61.10 - 61.29	3.06	78.10 - 78.29	3.91	95.10 - 95.29	4.76
5.21 - 5.30	.52	27.30 - 27.49	1.37	44.30 - 44.49	2.22	61.30 - 61.49	3.07	78.30 - 78.49	3.92	95.30 - 95.49	4.77
5.31 - 5.40	.53	27.50 - 27.69	1.38	44.50 - 44.69	2.23	61.50 - 61.69	3.08	78.50 - 78.69	3.93	95.50 - 95.69	4.78
5.41 - 5.50	.54	27.70 - 27.89	1.39	44.70 - 44.89	2.24	61.70 - 61.89	3.09	78.70 - 78.89	3.94	95.70 - 95.89	4.79
5.51 - 5.60	.55	27.90 - 28.09	1.40	44.90 - 45.09	2.25	61.90 - 62.09	3.10	78.90 - 79.09	3.95	95.90 - 96.09	4.80
5.61 - 5.70	.56	28.10 - 28.29	1.41	45.10 - 45.29	2.26	62.10 - 62.29	3.11	79.10 - 79.29	3.96	96.10 - 96.29	4.81
5.71 - 5.80	.57	28.30 - 28.49	1.42	45.30 - 45.49	2.27	62.30 - 62.49	3.12	79.30 - 79.49	3.97	96.30 - 96.49	4.82
5.81 - 5.90	.58	28.50 - 28.69	1.43	45.50 - 45.69	2.28	62.50 - 62.69	3.13	79.50 - 79.69	3.98	96.50 - 96.69	4.83
5.91 - 6.00	.59	28.70 - 28.89	1.44	45.70 - 45.89	2.29	62.70 - 62.89	3.14	79.70 - 79.89	3.99	96.70 - 96.89	4.84
6.01 - 6.10	.60	28.90 - 29.09	1.45	45.90 - 46.09	2.30	62.90 - 63.09	3.15	79.90 - 80.09	4.00	96.90 - 97.09	4.85
6.11 - 6.20	.61	29.10 - 29.29	1.46	46.10 - 46.29	2.31	63.10 - 63.29	3.16	80.10 - 80.29	4.01	97.10 - 97.29	4.86
6.21 - 6.30	.62	29.30 - 29.49	1.47	46.30 - 46.49	2.32	63.30 - 63.49	3.17	80.30 - 80.49	4.02	97.30 - 97.49	4.87
6.31 - 6.40	.63	29.50 - 29.69	1.48	46.50 - 46.69	2.33	63.50 - 63.69	3.18	80.50 - 80.69	4.03	97.50 - 97.69	4.88
6.41 - 6.50	.64	29.70 - 29.89	1.49	46.70 - 46.89	2.34	63.70 - 63.89	3.19	80.70 - 80.89	4.04	97.70 - 97.89	4.89
6.51 - 6.60	.65	29.90 - 30.09	1.50	46.90 - 47.09	2.35	63.90 - 64.09	3.20	80.90 - 81.09	4.05	97.90 - 98.09	4.90
6.61 - 6.70	.66	30.10 - 30.29	1.51	47.10 - 47.29	2.36	64.10 - 64.29	3.21	81.10 - 81.29	4.06	98.10 - 98.29	4.91
6.71 - 6.80	.67	30.30 - 30.49	1.52	47.30 - 47.49	2.37	64.30 - 64.49	3.22	81.30 - 81.49	4.07	98.30 - 98.49	4.92
6.81 - 6.90	.68	30.50 - 30.69	1.53	47.50 - 47.69	2.38	64.50 - 64.69	3.23	81.50 - 81.69	4.08	98.50 - 98.69	4.93
6.91 - 7.00	.69	30.70 - 30.89	1.54	47.70 - 47.89	2.39	64.70 - 64.89	3.24	81.70 - 81.89	4.09	98.70 - 98.89	4.94
7.01 - 7.10	.70	30.90 - 31.09	1.55	47.90 - 48.09	2.40	64.90 - 65.09	3.25	81.90 - 82.09	4.10	98.90 - 99.09	4.95
7.11 - 7.20	.71	31.10 - 31.29	1.56	48.10 - 48.29	2.41	65.10 - 65.29	3.26	82.10 - 82.29	4.11	99.10 - 99.29	4.96
7.21 - 7.30	.72	31.30 - 31.49	1.57	48.30 - 48.49	2.42	65.30 - 65.49	3.27	82.30 - 82.49	4.12	99.30 - 99.49	4.97
7.31 - 7.40	.73	31.50 - 31.69	1.58	48.50 - 48.69	2.43	65.50 - 65.69	3.28	82.50 - 82.69	4.13	99.50 - 99.69	4.98
7.41 - 7.50	.74	31.70 - 31.89	1.59	48.70 - 48.89	2.44	65.70 - 65.89	3.29	82.70 - 82.89	4.14	99.70 - 99.89	4.99
7.51 - 7.60	.75	31.90 - 32.09	1.60	48.90 - 49.09	2.45	65.90 - 66.09	3.30	82.90 - 83.09	4.15	99.90 - 100.09	5.00
7.61 - 7.70	.76	32.10 - 32.29	1.61	49.10 - 49.29	2.46	66.10 - 66.29	3.31	83.10 - 83.29	4.16	100.10 - 100.29	5.01
7.71 - 7.80	.77	32.30 - 32.49	1.62	49.30 - 49.49	2.47	66.30 - 66.49	3.32	83.30 - 83.49	4.17	100.30 - 100.49	5.02
7.81 - 7.90	.78	32.50 - 32.69	1.63	49.50 -							

**CANADA PENSION PLAN CONTRIBUTIONS
AND UNEMPLOYMENT INSURANCE PREMIUMS**

WEEKLY PAY PERIOD

\$0.00- \$133.18

Remuneration Remuneration		C.P.P. R.P.C.	U.I. Premium Prime d'a.c.		Remuneration Remuneration		C.P.P. R.P.C.	U.I. Premium Prime d'a.c.		Remuneration Remuneration		C.P.P. R.P.C.	U.I. Premium Prime d'a.c.	
From-to	To-a		Regular Ordinaire	Reduced Réduit	From-to	To-a		Regular Ordinaire	Reduced Réduit	From-to	To-a		Regular Ordinaire	Reduced Réduit
\$.00	\$ 13.46	.00	.00	.00	\$ 53.19	\$ 53.73	.72	.75	.60	\$ 93.19	\$ 93.73	1.44	1.31	1.05
13.47	14.29	.01	.00	.00	53.74	54.29	.73	.76	.60	93.74	94.29	1.45	1.32	1.05
14.30	14.84	.02	.00	.00	54.30	54.84	.74	.76	.61	94.30	94.84	1.46	1.32	1.06
14.85	15.40	.03	.00	.00	54.85	55.40	.75	.77	.62	94.85	95.40	1.47	1.33	1.07
15.41	15.95	.04	.00	.00	55.41	55.95	.76	.78	.62	95.41	95.95	1.48	1.34	1.07
15.96	16.51	.05	.00	.00	55.96	56.51	.77	.79	.63	95.96	96.51	1.49	1.35	1.08
16.52	17.07	.06	.00	.00	56.52	57.07	.78	.80	.64	96.52	97.07	1.50	1.36	1.08
17.08	17.62	.07	.00	.00	57.08	57.62	.79	.80	.64	97.08	97.62	1.51	1.36	1.09
17.63	18.18	.08	.00	.00	57.63	58.18	.80	.81	.65	97.63	98.18	1.52	1.37	1.10
18.19	18.73	.09	.00	.00	58.19	58.73	.81	.82	.65	98.19	98.73	1.53	1.38	1.10
18.74	19.29	.10	.00	.00	58.74	59.29	.82	.83	.66	98.74	99.29	1.54	1.39	1.11
19.30	19.84	.11	.00	.00	59.30	59.84	.83	.83	.66	99.30	99.84	1.55	1.39	1.12
19.85	20.40	.12	.00	.00	59.85	60.40	.84	.85	.67	99.85	100.40	1.56	1.40	1.12
20.41	20.95	.13	.00	.00	60.41	60.95	.85	.85	.68	100.41	100.95	1.57	1.41	1.13
20.96	21.51	.14	.00	.00	60.96	61.51	.86	.86	.69	100.96	101.51	1.58	1.42	1.13
21.52	22.07	.15	.00	.00	61.52	62.07	.87	.87	.69	101.52	102.07	1.59	1.43	1.14
22.08	22.62	.16	.00	.00	62.08	62.62	.88	.87	.70	102.08	102.62	1.60	1.43	1.15
22.63	23.18	.17	.00	.00	62.63	63.18	.89	.88	.70	102.63	103.18	1.61	1.44	1.15
23.19	23.73	.18	.00	.00	63.19	63.73	.90	.90	.71	103.19	103.73	1.62	1.45	1.16
23.74	24.29	.19	.00	.00	63.74	64.29	.91	.90	.72	103.74	104.29	1.63	1.46	1.16
24.30	24.84	.20	.00	.00	64.30	64.84	.92	.90	.72	104.30	104.84	1.64	1.46	1.17
24.85	25.40	.21	.00	.00	64.85	65.40	.93	.91	.73	104.85	105.40	1.65	1.47	1.18
25.41	25.95	.22	.00	.00	65.41	65.95	.94	.92	.74	105.41	105.95	1.66	1.48	1.18
25.96	26.51	.23	.00	.00	65.96	66.51	.95	.93	.74	105.96	106.51	1.67	1.49	1.19
26.52	27.07	.24	.00	.00	66.52	67.07	.96	.94	.75	106.52	107.07	1.68	1.50	1.20
27.08	27.62	.25	.00	.00	67.08	67.62	.97	.94	.75	107.08	107.62	1.69	1.50	1.20
27.63	27.99	.26	.00	.00	67.63	68.18	.98	.95	.76	107.63	108.18	1.70	1.51	1.21
28.00	28.73	.27	.40	.32*	68.19	68.73	.99	.96	.77	108.19	108.73	1.71	1.52	1.21
28.74	29.29	.28	.41	.32	68.74	69.29	1.00	.97	.77	108.74	109.29	1.72	1.53	1.22
29.30	29.84	.29	.41	.33	69.30	69.84	1.01	.97	.78	109.30	109.84	1.73	1.53	1.23
29.85	30.40	.30	.42	.34	69.85	70.40	1.02	.98	.79	109.85	110.40	1.74	1.54	1.23
30.41	30.95	.31	.43	.34	70.41	70.95	1.03	.99	.79	110.41	110.95	1.75	1.55	1.24
30.96	31.51	.32	.44	.35	70.96	71.51	1.04	1.00	.80	110.96	111.51	1.76	1.56	1.25
31.52	32.07	.33	.45	.36	71.52	72.07	1.05	1.01	.80	111.52	112.07	1.77	1.57	1.25
32.08	32.62	.34	.45	.36	72.08	72.62	1.06	1.01	.81	112.08	112.62	1.78	1.57	1.26
32.63	33.18	.35	.46	.37	72.63	73.18	1.07	1.02	.82	112.63	113.18	1.79	1.58	1.26
33.19	33.73	.36	.47	.37	73.19	73.73	1.08	1.03	.82	113.19	113.73	1.80	1.59	1.27
33.74	34.29	.37	.48	.38	73.74	74.29	1.09	1.04	.83	113.74	114.29	1.81	1.60	1.28
34.30	34.84	.38	.48	.39	74.30	74.84	1.10	1.04	.84	114.30	114.84	1.82	1.60	1.28
34.85	35.40	.39	.49	.39	74.85	75.40	1.11	1.05	.84	114.85	115.40	1.83	1.61	1.29
35.41	35.95	.40	.50	.40	75.41	75.95	1.12	1.06	.85	115.41	115.95	1.84	1.62	1.30
35.96	36.51	.41	.51	.41	75.96	76.51	1.13	1.07	.85	115.96	116.51	1.85	1.63	1.30
36.52	37.07	.42	.52	.41	76.52	77.07	1.14	1.08	.86	116.52	117.07	1.86	1.64	1.31
37.08	37.62	.43	.52	.42	77.08	77.62	1.15	1.08	.87	117.08	117.62	1.87	1.64	1.31
37.63	38.18	.44	.53	.42	77.63	78.18	1.16	1.09	.87	117.63	118.18	1.88	1.65	1.32
38.19	38.73	.45	.54	.43	78.19	78.73	1.17	1.10	.88	118.19	118.73	1.89	1.66	1.33
38.74	39.29	.46	.55	.44	78.74	79.29	1.18	1.11	.88	118.74	119.29	1.90	1.67	1.33
39.30	39.84	.47	.55	.44	79.30	79.84	1.19	1.11	.89	119.30	119.84	1.91	1.67	1.34
39.85	40.40	.48	.56	.45	79.85	80.40	1.20	1.12	.90	119.85	120.40	1.92	1.68	1.35
40.41	40.95	.49	.57	.46	80.41	80.95	1.21	1.13	.90	120.41	120.95	1.93	1.69	1.35
40.96	41.51	.50	.58	.46	80.96	81.51	1.22	1.14	.91	120.96	121.51	1.94	1.70	1.36
41.52	42.07	.51	.59	.47	81.52	82.07	1.23	1.15	.92	121.52	122.07	1.95	1.71	1.36
42.08	42.62	.52	.59	.47	82.08	82.62	1.24	1.15	.92	122.08	122.62	1.96	1.71	1.37
42.63	43.18	.53	.60	.48	82.63	83.18	1.25	1.16	.93	122.63	123.18	1.97	1.72	1.38
43.19	43.73	.54	.61	.49	83.19	83.73	1.26	1.17	.93	123.19	123.73	1.98	1.73	1.38
43.74	44.29	.55	.62	.49	83.74	84.29	1.27	1.18	.94	123.74	124.29	1.99	1.74	1.39
44.30	44.84	.56	.62	.50	84.30	84.84	1.28	1.18	.95	124.30	124.84	2.00	1.74	1.40
44.85	45.40	.57	.63	.51	84.85	85.40	1.29	1.19	.95	124.85	125.40	2.01	1.75	1.40
45.41	45.95	.58	.64	.51	85.41	85.95	1.30	1.20	.96	125.41	125.95	2.02	1.76	1.41
45.96	46.51	.59	.65	.52	85.96	86.51	1.31	1.21	.97	125.96	126.51	2.03	1.77	1.41
46.52	47.07	.60	.66	.52	86.52	87.07	1.32	1.22	.97	126.52	127.07	2.04	1.78	1.42
47.08	47.62	.61	.66	.53	87.08	87.62	1.33	1.22	.98	127.08	127.62	2.05	1.78	1.43
47.63	48.18	.62	.67	.54	87.63	88.18	1.34	1.23	.98	127.63	128.18	2.06	1.79	1.43
48.19	48.73	.63	.68	.54	88.19	88.73	1.35	1.24	.99	128.19	128.73	2.07	1.80	1.44
48.74	49.29	.64	.69	.55	88.74	89.29	1.36	1.25	1.00	128.74	129.29	2.08	1.81	1.44
49.30	49.84	.65	.69	.56	89.30	89.84	1.37	1.25	1.00	129.30	129.84	2.09	1.81	1.45
49.85	50.40	.66	.70	.56	89.85	90.40	1.38	1.26	1.01	129.85	130.40	2.10	1.82	1.46
50.41	50.95	.67	.71	.57	90.41	90.95	1.39	1.27	1.02	130.41	130.95	2.11	1.83	1.46
50.96	51.51	.68	.72	.57	90.96	91.51	1.40	1.28	1.02	130.96	131.51	2.12	1.84	1.47
51.52	52.07	.69	.73	.58	91.52	92.07	1.41	1.29	1.03	131.52	132.07	2.13	1.85	1.48
52.08	52.62	.70	.73	.59	92.08	92.62	1.42	1.29	1.03	132.08	132.62	2.14	1.85	1.48
52.63	53.18	.71	.74	.59	92.63	93.18	1.43	1.30	1.04	132.63	133.18	2.15	1.86	1.49

*See page 28 for Minimum Insurable Earnings for each province.

*Voir, à la page 28, la rémunération assurable minimum pour chaque province.

CANADA PENSION PLAN CONTRIBUTIONS AND UNEMPLOYMENT INSURANCE PREMIUMS

WEEKLY PAY PERIOD

\$133.19 — \$518.17

Remuneration Rémunération		C.P.P. R.P.C.	U.I. Premium Prime d'a-c.		Remuneration Rémunération		C.P.P. R.P.C.	U.I. Premium Prime d'a-c.		Remuneration Rémunération		C.P.P. R.P.C.	U.I. Premium Prime d'a-c.	
From-de	To-a		Regular Ordinaire	Reduced Réduite	From-de	To-a		Regular Ordinaire	Reduced Réduite	From-de	To-a		Regular Ordinaire	Reduced Réduite
\$ 133.19	\$ 133.73	2.16	1.87	1.49	\$ 173.19	\$ 173.73	2.88	2.38	1.90	\$ 213.19	\$ 218.17	3.64	2.38	1.90
133.74	134.29	2.17	1.88	1.50	173.74	174.29	2.89	2.38	1.90	218.18	223.18	3.73	2.38	1.90
134.30	134.84	2.18	1.88	1.51	174.30	174.84	2.90	2.38	1.90	223.19	228.17	3.82	2.38	1.90
134.85	135.40	2.19	1.89	1.51	174.85	175.40	2.91	2.38	1.90	228.18	233.18	3.91	2.38	1.90
135.41	135.95	2.20	1.90	1.52	175.41	175.95	2.92	2.38	1.90	233.19	238.17	4.00	2.38	1.90
135.96	136.51	2.21	1.91	1.53	175.96	176.51	2.93	2.38	1.90	238.18	243.18	4.09	2.38	1.90
136.52	137.07	2.22	1.92	1.53	176.52	177.07	2.94	2.38	1.90	243.19	248.17	4.18	2.38	1.90
137.08	137.62	2.23	1.92	1.54	177.08	177.62	2.95	2.38	1.90	248.18	253.18	4.27	2.38	1.90
137.63	138.18	2.24	1.93	1.54	177.63	178.18	2.96	2.38	1.90	253.19	258.17	4.36	2.38	1.90
138.19	138.73	2.25	1.94	1.55	178.19	178.73	2.97	2.38	1.90	258.18	263.18	4.45	2.38	1.90
138.74	139.29	2.26	1.95	1.56	178.74	179.29	2.98	2.38	1.90	263.19	268.17	4.54	2.38	1.90
139.30	139.84	2.27	1.95	1.56	179.30	179.84	2.99	2.38	1.90	268.18	273.18	4.63	2.38	1.90
139.85	140.40	2.28	1.96	1.57	179.85	180.40	3.00	2.38	1.90	273.19	278.17	4.72	2.38	1.90
140.41	140.95	2.29	1.97	1.58	180.41	180.95	3.01	2.38	1.90	278.18	283.18	4.81	2.38	1.90
140.96	141.51	2.30	1.98	1.58	180.96	181.51	3.02	2.38	1.90	283.19	288.17	4.90	2.38	1.90
141.52	142.07	2.31	1.99	1.59	181.52	182.07	3.03	2.38	1.90	288.18	293.18	4.99	2.38	1.90
142.08	142.62	2.32	1.99	1.59	182.08	182.62	3.04	2.38	1.90	293.19	298.17	5.08	2.38	1.90
142.63	143.18	2.33	2.00	1.60	182.63	183.18	3.05	2.38	1.90	298.18	303.18	5.17	2.38	1.90
143.19	143.73	2.34	2.01	1.61	183.19	183.73	3.06	2.38	1.90	303.19	308.17	5.26	2.38	1.90
143.74	144.29	2.35	2.02	1.61	183.74	184.29	3.07	2.38	1.90	308.18	313.18	5.35	2.38	1.90
144.30	144.84	2.36	2.02	1.62	184.30	184.84	3.08	2.38	1.90	313.19	318.17	5.44	2.38	1.90
144.85	145.40	2.37	2.03	1.63	184.85	185.40	3.09	2.38	1.90	318.18	323.18	5.53	2.38	1.90
145.41	145.95	2.38	2.04	1.63	185.41	185.95	3.10	2.38	1.90	323.19	328.17	5.62	2.38	1.90
145.96	146.51	2.39	2.05	1.64	185.96	186.51	3.11	2.38	1.90	328.18	333.18	5.71	2.38	1.90
146.52	147.07	2.40	2.06	1.64	186.52	187.07	3.12	2.38	1.90	333.19	338.17	5.80	2.38	1.90
147.08	147.62	2.41	2.06	1.65	187.08	187.62	3.13	2.38	1.90	338.18	343.18	5.89	2.38	1.90
147.63	148.18	2.42	2.07	1.66	187.63	188.18	3.14	2.38	1.90	343.19	348.17	5.98	2.38	1.90
148.19	148.73	2.43	2.08	1.66	188.19	188.73	3.15	2.38	1.90	348.18	353.18	6.07	2.38	1.90
148.74	149.29	2.44	2.09	1.67	188.74	189.29	3.16	2.38	1.90	353.19	358.17	6.16	2.38	1.90
149.30	149.84	2.45	2.10	1.68	189.30	189.84	3.17	2.38	1.90	358.18	363.18	6.25	2.38	1.90
149.85	150.40	2.46	2.10	1.68	189.85	190.40	3.18	2.38	1.90	363.19	368.17	6.34	2.38	1.90
150.41	150.95	2.47	2.11	1.69	190.41	190.95	3.19	2.38	1.90	368.18	373.18	6.43	2.38	1.90
150.96	151.51	2.48	2.12	1.69	190.96	191.51	3.20	2.38	1.90	373.19	378.17	6.52	2.38	1.90
151.52	152.07	2.49	2.13	1.70	191.52	192.07	3.21	2.38	1.90	378.18	383.18	6.61	2.38	1.90
152.08	152.62	2.50	2.13	1.71	192.08	192.62	3.22	2.38	1.90	383.19	388.17	6.70	2.38	1.90
152.63	153.18	2.51	2.14	1.71	192.63	193.18	3.23	2.38	1.90	388.18	393.18	6.79	2.38	1.90
153.19	153.73	2.52	2.15	1.72	193.19	193.73	3.24	2.38	1.90	393.19	398.17	6.88	2.38	1.90
153.74	154.29	2.53	2.16	1.72	193.74	194.29	3.25	2.38	1.90	398.18	403.18	6.97	2.38	1.90
154.30	154.84	2.54	2.16	1.73	194.30	194.84	3.26	2.38	1.90	403.19	408.17	7.06	2.38	1.90
154.85	155.40	2.55	2.17	1.74	194.85	195.40	3.27	2.38	1.90	408.18	413.18	7.15	2.38	1.90
155.41	155.95	2.56	2.18	1.74	195.41	195.95	3.28	2.38	1.90	413.19	418.17	7.24	2.38	1.90
155.96	156.51	2.57	2.19	1.75	195.96	196.51	3.29	2.38	1.90	418.18	423.18	7.33	2.38	1.90
156.52	157.07	2.58	2.20	1.76	196.52	197.07	3.30	2.38	1.90	423.19	428.17	7.42	2.38	1.90
157.08	157.62	2.59	2.20	1.76	197.08	197.62	3.31	2.38	1.90	428.18	433.18	7.51	2.38	1.90
157.63	158.18	2.60	2.21	1.77	197.63	198.18	3.32	2.38	1.90	433.19	438.17	7.60	2.38	1.90
158.19	158.73	2.61	2.22	1.77	198.19	198.73	3.33	2.38	1.90	438.18	443.18	7.69	2.38	1.90
158.74	159.29	2.62	2.23	1.78	198.74	199.29	3.34	2.38	1.90	443.19	448.17	7.78	2.38	1.90
159.30	159.84	2.63	2.23	1.79	199.30	199.84	3.35	2.38	1.90	448.18	453.18	7.87	2.38	1.90
159.85	160.40	2.64	2.24	1.79	199.85	200.40	3.36	2.38	1.90	453.19	458.17	7.96	2.38	1.90
160.41	160.95	2.65	2.25	1.80	200.41	200.95	3.37	2.38	1.90	458.18	463.18	8.05	2.38	1.90
160.96	161.51	2.66	2.26	1.81	200.96	201.51	3.38	2.38	1.90	463.19	468.17	8.14	2.38	1.90
161.52	162.07	2.67	2.27	1.81	201.52	202.07	3.39	2.38	1.90	468.18	473.18	8.23	2.38	1.90
162.08	162.62	2.68	2.27	1.82	202.08	202.62	3.40	2.38	1.90	473.19	478.17	8.32	2.38	1.90
162.63	163.18	2.69	2.28	1.82	202.63	203.18	3.41	2.38	1.90	478.18	483.18	8.41	2.38	1.90
163.19	163.73	2.70	2.29	1.83	203.19	203.73	3.42	2.38	1.90	483.19	488.17	8.50	2.38	1.90
163.74	164.29	2.71	2.30	1.84	203.74	204.29	3.43	2.38	1.90	488.18	493.18	8.59	2.38	1.90
164.30	164.84	2.72	2.30	1.84	204.30	204.84	3.44	2.38	1.90	493.19	498.17	8.68	2.38	1.90
164.85	165.40	2.73	2.31	1.85	204.85	205.40	3.45	2.38	1.90	498.18	503.18	8.77	2.38	1.90
165.41	165.95	2.74	2.32	1.86	205.41	205.95	3.46	2.38	1.90	503.19	508.17	8.86	2.38	1.90
165.96	166.51	2.75	2.33	1.86	205.96	206.51	3.47	2.38	1.90	508.18	513.18	8.95	2.38	1.90
166.52	167.07	2.76	2.34	1.87	206.52	207.07	3.48	2.38	1.90	513.19	518.17	9.04	2.38	1.90
167.08	167.62	2.77	2.34	1.87	207.08	207.62	3.49	2.38	1.90					
167.63	168.18	2.78	2.35	1.88	207.63	208.18	3.50	2.38	1.90					
168.19	168.73	2.79	2.36	1.89	208.19	208.73	3.51	2.38	1.90					
168.74	169.29	2.80	2.37	1.89	208.74	209.29	3.52	2.38	1.90					
169.30	169.84	2.81	2.37	1.90	209.30	209.84	3.53	2.38	1.90					
169.85	170.40	2.82	2.38	1.90	209.85	210.40	3.54	2.38	1.90					
170.41	170.95	2.83	2.38	1.90	210.41	210.95	3.55	2.38	1.90					
170.96	171.51	2.84	2.38	1.90	210.96	211.51	3.56	2.38	1.90					
171.52	172.07	2.85	2.38	1.90	211.52	212.07	3.57	2.38	1.90					
172.08	172.62	2.86	2.38	1.90	212.08	212.62	3.58	2.38	1.90					
172.63	173.18	2.87	2.38	1.90	212.63	213.18	3.59	2.38	1.90					

*For remuneration in excess of \$518.17:

- refer to page 8 under "Employee's Contribution—Calculation Method";
- the Unemployment Insurance premium is \$2.38 for employees at the regular rate and \$1.90 for employees at the reduced rate.*

*Si la rémunération dépasse \$518.17

- se reporter à la rubrique «Contribution de l'employé—Méthode de calcul», à la page 8.
- la prime d'assurance-chômage est \$2.38 dans le cas des employés assujettis au taux régulier et \$1.90 dans le cas des employés admis au taux réduit.*

CANADA PENSION PLAN CONTRIBUTIONS
AND UNEMPLOYMENT INSURANCE PREMIUMS

BI-WEEKLY PAY PERIOD

\$386.65 — \$506.64

Remuneration Remunération		C.P.P. R.P.C.	U.I. Premium Prime d'a.c.		Remuneration Remunération		C.P.P. R.P.C.	U.I. Premium Prime d'a.c.		Remuneration Remunération		C.P.P. R.P.C.	U.I. Premium Prime d'a.c.	
From-de	To-a		Regular Ordinaire	Reduced Réduit	From-de	To-a		Regular Ordinaire	Reduced Réduit	From-de	To-a		Regular Ordinaire	Reduced Réduit
\$ 386.65	\$ 387.19	6.48	4.76	3.81	\$ 426.65	\$ 427.19	7.20	4.76	3.81	\$ 466.65	\$ 467.19	7.92	4.76	3.81
387.20	387.75	6.49	4.76	3.81	427.20	427.75	7.21	4.76	3.81	467.20	467.75	7.93	4.76	3.81
387.76	388.30	6.50	4.76	3.81	427.76	428.30	7.22	4.76	3.81	467.76	468.30	7.94	4.76	3.81
388.31	388.86	6.51	4.76	3.81	428.31	428.86	7.23	4.76	3.81	468.31	468.86	7.95	4.76	3.81
388.87	389.41	6.52	4.76	3.81	428.87	429.41	7.24	4.76	3.81	468.87	469.41	7.96	4.76	3.81
389.42	389.97	6.53	4.76	3.81	429.42	429.97	7.25	4.76	3.81	469.42	469.97	7.97	4.76	3.81
389.98	390.53	6.54	4.76	3.81	429.98	430.53	7.26	4.76	3.81	469.98	470.53	7.98	4.76	3.81
390.54	391.08	6.55	4.76	3.81	430.54	431.08	7.27	4.76	3.81	470.54	471.08	7.99	4.76	3.81
391.09	391.64	6.56	4.76	3.81	431.09	431.64	7.28	4.76	3.81	471.09	471.64	8.00	4.76	3.81
391.65	392.19	6.57	4.76	3.81	431.65	432.19	7.29	4.76	3.81	471.65	472.19	8.01	4.76	3.81
392.20	392.75	6.58	4.76	3.81	432.20	432.75	7.30	4.76	3.81	472.20	472.75	8.02	4.76	3.81
392.76	393.30	6.59	4.76	3.81	432.76	433.30	7.31	4.76	3.81	472.76	473.30	8.03	4.76	3.81
393.31	393.86	6.60	4.76	3.81	433.31	433.86	7.32	4.76	3.81	473.31	473.86	8.04	4.76	3.81
393.87	394.41	6.61	4.76	3.81	433.87	434.41	7.33	4.76	3.81	473.87	474.41	8.05	4.76	3.81
394.42	394.97	6.62	4.76	3.81	434.42	434.97	7.34	4.76	3.81	474.42	474.97	8.06	4.76	3.81
394.98	395.53	6.63	4.76	3.81	434.98	435.53	7.35	4.76	3.81	474.98	475.53	8.07	4.76	3.81
395.54	396.08	6.64	4.76	3.81	435.54	436.08	7.36	4.76	3.81	475.54	476.08	8.08	4.76	3.81
396.09	396.64	6.65	4.76	3.81	436.09	436.64	7.37	4.76	3.81	476.09	476.64	8.09	4.76	3.81
396.65	397.19	6.66	4.76	3.81	436.65	397.19	7.38	4.76	3.81	476.65	477.19	8.10	4.76	3.81
397.20	397.75	6.67	4.76	3.81	437.20	437.75	7.39	4.76	3.81	477.20	477.75	8.11	4.76	3.81
397.76	398.30	6.68	4.76	3.81	437.76	438.30	7.40	4.76	3.81	477.76	478.30	8.12	4.76	3.81
398.31	398.86	6.69	4.76	3.81	438.31	438.86	7.41	4.76	3.81	478.31	478.86	8.13	4.76	3.81
398.87	399.41	6.70	4.76	3.81	438.87	439.41	7.42	4.76	3.81	478.87	479.41	8.14	4.76	3.81
399.42	399.97	6.71	4.76	3.81	439.42	439.97	7.43	4.76	3.81	479.42	479.97	8.15	4.76	3.81
399.98	400.53	6.72	4.76	3.81	439.98	440.53	7.44	4.76	3.81	479.98	480.53	8.16	4.76	3.81
400.54	401.08	6.73	4.76	3.81	440.54	441.08	7.45	4.76	3.81	480.54	481.08	8.17	4.76	3.81
401.09	401.64	6.74	4.76	3.81	441.09	441.64	7.46	4.76	3.81	481.09	481.64	8.18	4.76	3.81
401.65	402.19	6.75	4.76	3.81	441.65	442.19	7.47	4.76	3.81	481.65	482.19	8.19	4.76	3.81
402.20	402.75	6.76	4.76	3.81	442.20	442.75	7.48	4.76	3.81	482.20	482.75	8.20	4.76	3.81
402.76	403.30	6.77	4.76	3.81	442.76	443.30	7.49	4.76	3.81	482.76	483.30	8.21	4.76	3.81
403.31	403.86	6.78	4.76	3.81	443.31	443.86	7.50	4.76	3.81	483.31	483.86	8.22	4.76	3.81
403.87	404.41	6.79	4.76	3.81	443.87	444.41	7.51	4.76	3.81	483.87	484.41	8.23	4.76	3.81
404.42	404.97	6.80	4.76	3.81	444.42	444.97	7.52	4.76	3.81	484.42	484.97	8.24	4.76	3.81
404.98	405.53	6.81	4.76	3.81	444.98	445.53	7.53	4.76	3.81	484.98	485.53	8.25	4.76	3.81
405.54	406.08	6.82	4.76	3.81	445.54	446.08	7.54	4.76	3.81	485.54	486.08	8.26	4.76	3.81
406.09	406.64	6.83	4.76	3.81	446.09	446.64	7.55	4.76	3.81	486.09	486.64	8.27	4.76	3.81
406.65	407.19	6.84	4.76	3.81	446.65	447.19	7.56	4.76	3.81	486.65	487.19	8.28	4.76	3.81
407.20	407.75	6.85	4.76	3.81	447.20	447.75	7.57	4.76	3.81	487.20	487.75	8.29	4.76	3.81
407.76	408.30	6.86	4.76	3.81	447.76	448.30	7.58	4.76	3.81	487.76	488.30	8.30	4.76	3.81
408.31	408.86	6.87	4.76	3.81	448.31	448.86	7.59	4.76	3.81	488.31	488.86	8.31	4.76	3.81
408.87	409.41	6.88	4.76	3.81	448.87	449.41	7.60	4.76	3.81	488.87	489.41	8.32	4.76	3.81
409.42	409.97	6.89	4.76	3.81	449.42	449.97	7.61	4.76	3.81	489.42	489.97	8.33	4.76	3.81
409.98	410.53	6.90	4.76	3.81	449.98	450.53	7.62	4.76	3.81	489.98	490.53	8.34	4.76	3.81
410.54	411.08	6.91	4.76	3.81	450.54	451.08	7.63	4.76	3.81	490.54	491.08	8.35	4.76	3.81
411.09	411.64	6.92	4.76	3.81	451.09	451.64	7.64	4.76	3.81	491.09	491.64	8.36	4.76	3.81
411.65	412.19	6.93	4.76	3.81	451.65	452.19	7.65	4.76	3.81	491.65	492.19	8.37	4.76	3.81
412.20	412.75	6.94	4.76	3.81	452.20	452.75	7.66	4.76	3.81	492.20	492.75	8.38	4.76	3.81
412.76	413.30	6.95	4.76	3.81	452.76	453.30	7.67	4.76	3.81	492.76	493.30	8.39	4.76	3.81
413.31	413.86	6.96	4.76	3.81	453.31	453.86	7.68	4.76	3.81	493.31	493.86	8.40	4.76	3.81
413.87	414.41	6.97	4.76	3.81	453.87	454.41	7.69	4.76	3.81	493.87	494.41	8.41	4.76	3.81
414.42	414.97	6.98	4.76	3.81	454.42	454.97	7.70	4.76	3.81	494.42	494.97	8.42	4.76	3.81
414.98	415.53	6.99	4.76	3.81	454.98	455.53	7.71	4.76	3.81	494.98	495.53	8.43	4.76	3.81
415.54	416.08	7.00	4.76	3.81	455.54	456.08	7.72	4.76	3.81	495.54	496.08	8.44	4.76	3.81
416.09	416.64	7.01	4.76	3.81	456.09	456.64	7.73	4.76	3.81	496.09	496.64	8.45	4.76	3.81
416.65	417.19	7.02	4.76	3.81	456.65	457.19	7.74	4.76	3.81	496.65	497.19	8.46	4.76	3.81
417.20	417.75	7.03	4.76	3.81	457.20	457.75	7.75	4.76	3.81	497.20	497.75	8.47	4.76	3.81
417.76	418.30	7.04	4.76	3.81	457.76	458.30	7.76	4.76	3.81	497.76	498.30	8.48	4.76	3.81
418.31	418.86	7.05	4.76	3.81	458.31	458.86	7.77	4.76	3.81	498.31	498.86	8.49	4.76	3.81
418.87	419.41	7.06	4.76	3.81	458.87	459.41	7.78	4.76	3.81	498.87	499.41	8.50	4.76	3.81
419.42	419.97	7.07	4.76	3.81	459.42	459.97	7.79	4.76	3.81	499.42	499.97	8.51	4.76	3.81
419.98	420.53	7.08	4.76	3.81	459.98	460.53	7.80	4.76	3.81	499.98	500.53	8.52	4.76	3.81
420.54	421.08	7.09	4.76	3.81	460.54	461.08	7.81	4.76	3.81	500.54	501.08	8.53	4.76	3.81
421.09	421.64	7.10	4.76	3.81	461.09	461.64	7.82	4.76	3.81	501.09	501.64	8.54	4.76	3.81
421.65	422.19	7.11	4.76	3.81	461.65	462.19	7.83	4.76	3.81	501.65	502.19	8.55	4.76	3.81
422.20	422.75	7.12	4.76	3.81	462.20	462.75	7.84	4.76	3.81	502.20	502.75	8.56	4.76	3.81
422.76	423.30	7.13	4.76	3.81	462.76	463.30	7.85	4.76	3.81	502.76	503.30	8.57	4.76	3.81
423.31	423.86	7.14	4.76	3.81	463.31	463.86	7.86	4.76	3.81	503.31	503.86	8.58	4.76	3.81
423.87	424.41	7.15	4.76	3.81	463.87	464.41	7.87	4.76	3.81	503.87	504.41	8.59	4.76	3.81
424.42	424.97	7.16	4.76	3.81	464.42	464.97	7.88	4.76	3.81	504.42	504.97	8.60	4.76	3.81
424.98	425.53	7.17	4.76	3.81	464.98	465.53	7.89	4.76	3.81	504.98	505.53	8.61	4.76	3.81
425.54	426.08	7.18	4.76	3.81	465.54	466.08	7.90	4.76	3.81	505.54	506.08	8.62	4.76	3.81
426.09	426.64	7.19	4.76	3.81	466.09	466.64	7.91	4.76	3.81	506.09	506.64	8.63	4.76	3.81

TABLE VI, continued

CANADA PENSION PLAN CONTRIBUTIONS
AND UNEMPLOYMENT INSURANCE PREMIUMS

BI-WEEKLY PAY PERIOD

\$506.65 — \$1,216.64

Remuneration Rémunération		C.P.P. R.P.C.	U.I. Premium Prime d'a.-c.		Remuneration Rémunération		C.P.P. R.P.C.	U.I. Premium Prime d'a.-c.		Remuneration Rémunération		C.P.P. R.P.C.	U.I. Premium Prime d'a.-c.	
From-de	To-a		Regular Ordinaire	Reduced Réduit	From-de	To-a		Regular Ordinaire	Reduced Réduit	From-de	To-a		Regular Ordinaire	Reduced Réduit
\$ 506.65	\$ 507.19	8.64	4.76	3.81	\$ 546.65	\$ 551.63	9.40	4.76	3.81	\$ 906.65	\$ 911.63	15.88	4.76	3.81
507.20	507.75	8.65	4.76	3.81	551.64	556.64	9.49	4.76	3.81	911.64	916.64	15.97	4.76	3.81
507.76	508.30	8.66	4.76	3.81	556.65	561.63	9.58	4.76	3.81	916.65	921.63	16.06	4.76	3.81
508.31	508.86	8.67	4.76	3.81	561.64	566.64	9.67	4.76	3.81	921.64	926.64	16.15	4.76	3.81
508.87	509.41	8.68	4.76	3.81	566.65	571.63	9.76	4.76	3.81	926.65	931.63	16.24	4.76	3.81
509.42	509.97	8.69	4.76	3.81	571.64	576.64	9.85	4.76	3.81	931.64	936.64	16.33	4.76	3.81
509.98	510.53	8.70	4.76	3.81	576.65	581.63	9.94	4.76	3.81	936.65	941.63	16.42	4.76	3.81
510.54	511.08	8.71	4.76	3.81	581.64	586.64	10.03	4.76	3.81	941.64	946.64	16.51	4.76	3.81
511.09	511.64	8.72	4.76	3.81	586.65	591.63	10.12	4.76	3.81	946.65	951.63	16.60	4.76	3.81
511.65	512.19	8.73	4.76	3.81	591.64	596.64	10.21	4.76	3.81	951.64	956.64	16.69	4.76	3.81
512.20	512.75	8.74	4.76	3.81	596.65	601.63	10.30	4.76	3.81	956.65	961.63	16.78	4.76	3.81
512.76	513.30	8.75	4.76	3.81	601.64	606.64	10.39	4.76	3.81	961.64	966.64	16.87	4.76	3.81
513.31	513.86	8.76	4.76	3.81	606.65	611.63	10.48	4.76	3.81	966.65	971.63	16.96	4.76	3.81
513.87	514.41	8.77	4.76	3.81	611.64	616.64	10.57	4.76	3.81	971.64	976.64	17.05	4.76	3.81
514.42	514.97	8.78	4.76	3.81	616.65	621.63	10.66	4.76	3.81	976.65	981.63	17.14	4.76	3.81
514.98	515.53	8.79	4.76	3.81	621.64	626.64	10.75	4.76	3.81	981.64	986.64	17.23	4.76	3.81
515.54	516.08	8.80	4.76	3.81	626.65	631.63	10.84	4.76	3.81	986.65	991.63	17.32	4.76	3.81
516.09	516.64	8.81	4.76	3.81	631.64	636.64	10.93	4.76	3.81	991.64	996.64	17.41	4.76	3.81
516.65	517.19	8.82	4.76	3.81	636.65	641.63	11.02	4.76	3.81	996.65	1001.63	17.50	4.76	3.81
517.20	517.75	8.83	4.76	3.81	641.64	646.64	11.11	4.76	3.81	1001.64	1006.64	17.59	4.76	3.81
517.76	518.30	8.84	4.76	3.81	646.65	651.63	11.20	4.76	3.81	1006.65	1011.63	17.68	4.76	3.81
518.31	518.86	8.85	4.76	3.81	651.64	656.64	11.29	4.76	3.81	1011.64	1016.64	17.77	4.76	3.81
518.87	519.41	8.86	4.76	3.81	656.65	661.63	11.38	4.76	3.81	1016.65	1021.63	17.86	4.76	3.81
519.42	519.97	8.87	4.76	3.81	661.64	666.64	11.47	4.76	3.81	1021.64	1026.64	17.95	4.76	3.81
519.98	520.53	8.88	4.76	3.81	666.65	671.63	11.56	4.76	3.81	1026.65	1031.63	18.04	4.76	3.81
520.54	521.08	8.89	4.76	3.81	671.64	676.64	11.65	4.76	3.81	1031.64	1036.64	18.13	4.76	3.81
521.09	521.64	8.90	4.76	3.81	676.65	681.63	11.74	4.76	3.81	1036.65	1041.63	18.22	4.76	3.81
521.65	522.19	8.91	4.76	3.81	681.64	686.64	11.83	4.76	3.81	1041.64	1046.64	18.31	4.76	3.81
522.20	522.75	8.92	4.76	3.81	686.65	691.63	11.92	4.76	3.81	1046.65	1051.63	18.40	4.76	3.81
522.76	523.30	8.93	4.76	3.81	691.64	696.64	12.01	4.76	3.81	1051.64	1056.64	18.49	4.76	3.81
523.31	523.86	8.94	4.76	3.81	696.65	701.63	12.10	4.76	3.81	1056.65	1061.63	18.58	4.76	3.81
523.87	524.41	8.95	4.76	3.81	701.64	706.64	12.19	4.76	3.81	1061.64	1066.64	18.67	4.76	3.81
524.42	524.97	8.96	4.76	3.81	706.65	711.63	12.28	4.76	3.81	1066.65	1071.63	18.76	4.76	3.81
524.98	525.53	8.97	4.76	3.81	711.64	716.64	12.37	4.76	3.81	1071.64	1076.64	18.85	4.76	3.81
525.54	526.08	8.98	4.76	3.81	716.65	721.63	12.46	4.76	3.81	1076.65	1081.63	18.94	4.76	3.81
526.09	526.64	8.99	4.76	3.81	721.64	726.64	12.55	4.76	3.81	1081.64	1086.64	19.03	4.76	3.81
526.65	527.19	9.00	4.76	3.81	726.65	731.63	12.64	4.76	3.81	1086.65	1091.63	19.12	4.76	3.81
527.20	527.75	9.01	4.76	3.81	731.64	736.64	12.73	4.76	3.81	1091.64	1096.64	19.21	4.76	3.81
527.76	528.30	9.02	4.76	3.81	736.65	741.63	12.82	4.76	3.81	1096.65	1101.63	19.30	4.76	3.81
528.31	528.86	9.03	4.76	3.81	741.64	746.64	12.91	4.76	3.81	1101.64	1106.64	19.39	4.76	3.81
528.87	529.41	9.04	4.76	3.81	746.65	751.63	13.00	4.76	3.81	1106.65	1111.63	19.48	4.76	3.81
529.42	529.97	9.05	4.76	3.81	751.64	756.64	13.09	4.76	3.81	1111.64	1116.64	19.57	4.76	3.81
529.98	530.53	9.06	4.76	3.81	756.65	761.63	13.18	4.76	3.81	1116.65	1121.63	19.66	4.76	3.81
530.54	531.08	9.07	4.76	3.81	761.64	766.64	13.27	4.76	3.81	1121.64	1126.64	19.75	4.76	3.81
531.09	531.64	9.08	4.76	3.81	766.65	771.63	13.36	4.76	3.81	1126.65	1131.63	19.84	4.76	3.81
531.65	532.19	9.09	4.76	3.81	771.64	776.64	13.45	4.76	3.81	1131.64	1136.64	19.93	4.76	3.81
532.20	532.75	9.10	4.76	3.81	776.65	781.63	13.54	4.76	3.81	1136.65	1141.63	20.02	4.76	3.81
532.76	533.30	9.11	4.76	3.81	781.64	786.64	13.63	4.76	3.81	1141.64	1146.64	20.11	4.76	3.81
533.31	533.86	9.12	4.76	3.81	786.65	791.63	13.72	4.76	3.81	1146.65	1151.63	20.20	4.76	3.81
533.87	534.41	9.13	4.76	3.81	791.64	796.64	13.81	4.76	3.81	1151.64	1156.64	20.29	4.76	3.81
534.42	534.97	9.14	4.76	3.81	796.65	801.63	13.90	4.76	3.81	1156.65	1161.63	20.38	4.76	3.81
534.98	535.53	9.15	4.76	3.81	801.64	806.64	13.99	4.76	3.81	1161.64	1166.64	20.47	4.76	3.81
535.54	536.08	9.16	4.76	3.81	806.65	811.63	14.08	4.76	3.81	1166.65	1171.63	20.56	4.76	3.81
536.09	536.64	9.17	4.76	3.81	811.64	816.64	14.17	4.76	3.81	1171.64	1176.64	20.65	4.76	3.81
536.65	537.19	9.18	4.76	3.81	816.65	821.63	14.26	4.76	3.81	1176.65	1181.63	20.74	4.76	3.81
537.20	537.75	9.19	4.76	3.81	821.64	826.64	14.35	4.76	3.81	1181.64	1186.64	20.83	4.76	3.81
537.76	538.30	9.20	4.76	3.81	826.65	831.63	14.44	4.76	3.81	1186.65	1191.63	20.92	4.76	3.81
538.31	538.86	9.21	4.76	3.81	831.64	836.64	14.53	4.76	3.81	1191.64	1196.64	21.01	4.76	3.81
538.87	539.41	9.22	4.76	3.81	836.65	841.63	14.62	4.76	3.81	1196.65	1201.63	21.10	4.76	3.81
539.42	539.97	9.23	4.76	3.81	841.64	846.64	14.71	4.76	3.81	1201.64	1206.64	21.19	4.76	3.81
539.98	540.53	9.24	4.76	3.81	846.65	851.63	14.80	4.76	3.81	1206.65	1211.63	21.28	4.76	3.81
540.54	541.08	9.25	4.76	3.81	851.64	856.64	14.89	4.76	3.81	1211.64	1216.64	21.37	4.76	3.81
541.09	541.64	9.26	4.76	3.81	856.65	861.63	14.98	4.76	3.81					
541.65	542.19	9.27	4.76	3.81	861.64	866.64	15.07	4.76	3.81					
542.20	542.75	9.28	4.76	3.81	866.65	871.63	15.16	4.76	3.81					
542.76	543.30	9.29	4.76	3.81	871.64	876.64	15.25	4.76	3.81					
543.31	543.86	9.30	4.76	3.81	876.65	881.63	15.34	4.76	3.81					
543.87	544.41	9.31	4.76	3.81	881.64	886.64	15.43	4.76	3.81					
544.42	544.97	9.32	4.76	3.81	886.65	891.63	15.52	4.76	3.81					
544.98	545.53	9.33	4.76	3.81	891.64	896.64	15.61	4.76	3.81					
545.54	546.08	9.34	4.76	3.81	896.65	901.63	15.70	4.76	3.81					
546.09	546.64	9.35	4.76	3.81	901.64	906.64	15.79	4.76	3.81					

* For remuneration in excess of \$1,216.64
(a) refer to page 8 under "Employee's Contribution - Calculation Method";
(b) The Unemployment Insurance premium is \$4.76 for employees at the regular rate and \$3.81 for employees at the reduced rate.

"Si la rémunération dépasse \$1,216.64
a) se reporter à la rubrique «Contribution de l'Employé - Méthode par le calcul», à la page 8
b) La prime d'assurance-chômage est de \$4.76 dans le cas des employés assujettis au taux ordinaire et de \$3

TABLE VII

CANADA PENSION PLAN CONTRIBUTIONS
AND UNEMPLOYMENT INSURANCE PREMIUMS

MONTHLY PAY PERIOD

\$898.06 — \$1,018.05

Remuneration Remunération		C.P.P. R.P.C.		U.I. Premium Prime d'a.c.		Remuneration Remunération		C.P.P. R.P.C.		U.I. Premium Prime d'a.c.		Remuneration Remunération		C.P.P. R.P.C.		U.I. Premium Prime d'a.c.	
From-de	To-a			Regular Ordinaire	Reduced Réduit	From-de	To-a			Regular Ordinaire	Reduced Réduit	From-de	To-a			Regular Ordinaire	Reduced Réduit
\$ 898.06	\$ 898.60	15.12	10.32	8.25		\$ 938.06	\$ 938.60	15.84	10.32	8.25		\$ 978.06	\$ 978.60	16.56	10.32	8.25	
898.61	899.16	15.13	10.32	8.25		938.61	939.16	15.85	10.32	8.25		978.61	979.16	16.57	10.32	8.25	
899.17	899.71	15.14	10.32	8.25		939.17	939.71	15.86	10.32	8.25		979.17	979.71	16.58	10.32	8.25	
899.72	900.27	15.15	10.32	8.25		939.72	940.27	15.87	10.32	8.25		979.72	980.27	16.59	10.32	8.25	
900.28	900.82	15.16	10.32	8.25		940.28	940.82	15.88	10.32	8.25		980.28	980.82	16.60	10.32	8.25	
900.83	901.38	15.17	10.32	8.25		940.83	941.38	15.89	10.32	8.25		980.83	981.38	16.61	10.32	8.25	
901.39	901.94	15.18	10.32	8.25		941.39	941.94	15.90	10.32	8.25		981.39	981.94	16.62	10.32	8.25	
901.95	902.49	15.19	10.32	8.25		941.95	942.49	15.91	10.32	8.25		981.95	982.49	16.63	10.32	8.25	
902.50	903.05	15.20	10.32	8.25		942.50	943.05	15.92	10.32	8.25		982.50	983.05	16.64	10.32	8.25	
903.06	903.60	15.21	10.32	8.25		943.06	943.60	15.93	10.32	8.25		983.06	983.60	16.65	10.32	8.25	
903.61	904.16	15.22	10.32	8.25		943.61	944.16	15.94	10.32	8.25		983.61	984.16	16.66	10.32	8.25	
904.17	904.71	15.23	10.32	8.25		944.17	944.71	15.95	10.32	8.25		984.17	984.71	16.67	10.32	8.25	
904.72	905.27	15.24	10.32	8.25		944.72	945.27	15.96	10.32	8.25		984.72	985.27	16.68	10.32	8.25	
905.28	905.82	15.25	10.32	8.25		945.28	945.82	15.97	10.32	8.25		985.28	985.82	16.69	10.32	8.25	
905.83	906.38	15.26	10.32	8.25		945.83	946.38	15.98	10.32	8.25		985.83	986.38	16.70	10.32	8.25	
906.39	906.94	15.27	10.32	8.25		946.39	946.94	15.99	10.32	8.25		986.39	986.94	16.71	10.32	8.25	
906.95	907.49	15.28	10.32	8.25		946.95	947.49	16.00	10.32	8.25		986.95	987.49	16.72	10.32	8.25	
907.50	908.05	15.29	10.32	8.25		947.50	948.05	16.01	10.32	8.25		987.50	988.05	16.73	10.32	8.25	
908.06	908.60	15.30	10.32	8.25		948.06	948.60	16.02	10.32	8.25		988.06	988.60	16.74	10.32	8.25	
908.61	909.16	15.31	10.32	8.25		948.61	949.16	16.03	10.32	8.25		988.61	989.16	16.75	10.32	8.25	
909.17	909.71	15.32	10.32	8.25		949.17	949.71	16.04	10.32	8.25		989.17	989.71	16.76	10.32	8.25	
909.72	910.27	15.33	10.32	8.25		949.72	950.27	16.05	10.32	8.25		989.72	990.27	16.77	10.32	8.25	
910.28	910.82	15.34	10.32	8.25		950.28	950.82	16.06	10.32	8.25		990.28	990.82	16.78	10.32	8.25	
910.83	911.38	15.35	10.32	8.25		950.83	951.38	16.07	10.32	8.25		990.83	991.38	16.79	10.32	8.25	
911.39	911.94	15.36	10.32	8.25		951.39	951.94	16.08	10.32	8.25		991.39	991.94	16.80	10.32	8.25	
911.95	912.49	15.37	10.32	8.25		951.95	952.49	16.09	10.32	8.25		991.95	992.49	16.81	10.32	8.25	
912.50	913.05	15.38	10.32	8.25		952.50	953.05	16.10	10.32	8.25		992.50	993.05	16.82	10.32	8.25	
913.06	913.60	15.39	10.32	8.25		953.06	953.60	16.11	10.32	8.25		993.06	993.60	16.83	10.32	8.25	
913.61	914.16	15.40	10.32	8.25		953.61	954.16	16.12	10.32	8.25		993.61	994.16	16.84	10.32	8.25	
914.17	914.71	15.41	10.32	8.25		954.17	954.71	16.13	10.32	8.25		994.17	994.71	16.85	10.32	8.25	
914.72	915.27	15.42	10.32	8.25		954.72	955.27	16.14	10.32	8.25		994.72	995.27	16.86	10.32	8.25	
915.28	915.82	15.43	10.32	8.25		955.28	955.82	16.15	10.32	8.25		995.28	995.82	16.87	10.32	8.25	
915.83	916.38	15.44	10.32	8.25		955.83	956.38	16.16	10.32	8.25		995.83	996.38	16.88	10.32	8.25	
916.39	916.94	15.45	10.32	8.25		956.39	956.94	16.17	10.32	8.25		996.39	996.94	16.89	10.32	8.25	
916.95	917.49	15.46	10.32	8.25		956.95	957.49	16.18	10.32	8.25		996.95	997.49	16.90	10.32	8.25	
917.50	918.05	15.47	10.32	8.25		957.50	958.05	16.19	10.32	8.25		997.50	998.05	16.91	10.32	8.25	
918.06	918.60	15.48	10.32	8.25		958.06	958.60	16.20	10.32	8.25		998.06	998.60	16.92	10.32	8.25	
918.61	919.16	15.49	10.32	8.25		958.61	959.16	16.21	10.32	8.25		998.61	999.16	16.93	10.32	8.25	
919.17	919.71	15.50	10.32	8.25		959.17	959.71	16.22	10.32	8.25		999.17	999.71	16.94	10.32	8.25	
919.72	920.27	15.51	10.32	8.25		959.72	960.27	16.23	10.32	8.25		999.72	1000.27	16.95	10.32	8.25	
920.28	920.82	15.52	10.32	8.25		960.28	960.82	16.24	10.32	8.25		1000.28	1000.82	16.96	10.32	8.25	
920.83	921.38	15.53	10.32	8.25		960.83	961.38	16.25	10.32	8.25		1000.83	1001.38	16.97	10.32	8.25	
921.39	921.94	15.54	10.32	8.25		961.39	961.94	16.26	10.32	8.25		1001.39	1001.94	16.98	10.32	8.25	
921.95	922.49	15.55	10.32	8.25		961.95	962.49	16.27	10.32	8.25		1001.95	1002.49	16.99	10.32	8.25	
922.50	923.05	15.56	10.32	8.25		962.50	963.05	16.28	10.32	8.25		1002.50	1003.05	17.00	10.32	8.25	
923.06	923.60	15.57	10.32	8.25		963.06	963.60	16.29	10.32	8.25		1003.06	1003.60	17.01	10.32	8.25	
923.61	924.16	15.58	10.32	8.25		963.61	964.16	16.30	10.32	8.25		1003.61	1004.16	17.02	10.32	8.25	
924.17	924.71	15.59	10.32	8.25		964.17	964.71	16.31	10.32	8.25		1004.17	1004.71	17.03	10.32	8.25	
924.72	925.27	15.60	10.32	8.25		964.72	965.27	16.32	10.32	8.25		1004.72	1005.27	17.04	10.32	8.25	
925.28	925.82	15.61	10.32	8.25		965.28	965.82	16.33	10.32	8.25		1005.28	1005.82	17.05	10.32	8.25	
925.83	926.38	15.62	10.32	8.25		965.83	966.38	16.34	10.32	8.25		1005.83	1006.38	17.06	10.32	8.25	
926.39	926.94	15.63	10.32	8.25		966.39	966.94	16.35	10.32	8.25		1006.39	1006.94	17.07	10.32	8.25	
926.95	927.49	15.64	10.32	8.25		966.95	967.49	16.36	10.32	8.25		1006.95	1007.49	17.08	10.32	8.25	
927.50	928.05	15.65	10.32	8.25		967.50	968.05	16.37	10.32	8.25		1007.50	1008.05	17.09	10.32	8.25	
928.06	928.60	15.66	10.32	8.25		968.06	968.60	16.38	10.32	8.25		1008.06	1008.60	17.10	10.32	8.25	
928.61	929.16	15.67	10.32	8.25		968.61	969.16	16.39	10.32	8.25		1008.61	1009.16	17.11	10.32	8.25	
929.17	929.71	15.68	10.32	8.25		969.17	969.71	16.40	10.32	8.25		1009.17	1009.71	17.12	10.32	8.25	
929.72	930.27	15.69	10.32	8.25		969.72	970.27	16.41	10.32	8.25		1009.72	1010.27	17.13	10.32	8.25	
930.28	930.82	15.70	10.32	8.25		970.28	970.82	16.42	10.32	8.25		1010.28	1010.82	17.14	10.32	8.25	
930.83	931.38	15.71	10.32	8.25		970.83	971.38	16.43	10.32	8.25		1010.83	1011.38	17.15	10.32	8.25	
931.39	931.94	15.72	10.32	8.25		971.39	971.94	16.44	10.32	8.25		1011.39	1011.94	17.16	10.32	8.25	
931.95	932.49	15.73	10.32	8.25		971.95	972.49	16.45	10.32	8.25		1011.95	1012.49	17.17	10.32	8.25	
932.50	933.05	15.74	10.32	8.25		972.50	973.05	16.46	10.32	8.25		1012.50	1013.05	17.18	10.32	8.25	
933.06	933.60	15.75	10.32	8.25		973.06	973.60	16.47	10.32	8.25		1013.06	1013.60	17.19	10.32	8.25	
933.61	934.16	15.76	10.32	8.25		973.61	974.16	16.48	10.32	8.25		1013.61	1014.16	17.			

CANADA PENSION PLAN CONTRIBUTIONS
AND UNEMPLOYMENT INSURANCE PREMIUMS

MONTHLY PAY PERIOD

\$1,018.06 — \$1,458.05

Remuneration Remunération			C.P.P. R.P.C.	U.I. Premium Prime d'a-c.		Remuneration Remunération			C.P.P. R.P.C.	U.I. Premium Prime d'a-c.		Remuneration Remunération			C.P.P. R.P.C.	U.I. Premium Prime d'a-c.			
From-to	To-a	Regular Ordinaire		Reduced Réduit	From-to	To-a	Regular Ordinaire	Reduced Réduit		From-to	To-a	Regular Ordinaire	Reduced Réduit						
\$1,018.06	\$1,018.60	17.28	10.32	8.25	\$1,058.06	\$1,058.60	18.00	10.32	8.25	\$1,098.06	\$1,103.04	18.76	10.32	8.25	\$1,138.06	\$1,143.04	19.48	10.32	8.25
1,018.61	1,019.16	17.29	10.32	8.25	1,058.61	1,059.16	18.01	10.32	8.25	1,103.05	1,108.05	18.85	10.32	8.25	1,143.05	1,148.05	19.57	10.32	8.25
1,019.17	1,019.71	17.30	10.32	8.25	1,059.17	1,059.71	18.02	10.32	8.25	1,108.06	1,113.04	18.94	10.32	8.25	1,148.06	1,153.04	19.66	10.32	8.25
1,019.72	1,020.27	17.31	10.32	8.25	1,059.72	1,060.27	18.03	10.32	8.25	1,113.05	1,118.05	19.03	10.32	8.25	1,153.05	1,158.05	19.75	10.32	8.25
1,020.28	1,020.82	17.32	10.32	8.25	1,060.28	1,060.82	18.04	10.32	8.25	1,118.06	1,123.04	19.12	10.32	8.25	1,158.06	1,163.04	19.84	10.32	8.25
1,020.83	1,021.38	17.33	10.32	8.25	1,060.83	1,061.38	18.05	10.32	8.25	1,123.05	1,128.05	19.21	10.32	8.25	1,163.05	1,168.05	19.93	10.32	8.25
1,021.39	1,021.94	17.34	10.32	8.25	1,061.39	1,061.94	18.06	10.32	8.25	1,128.06	1,133.04	19.30	10.32	8.25	1,168.06	1,173.04	20.02	10.32	8.25
1,021.95	1,022.49	17.35	10.32	8.25	1,061.95	1,062.49	18.07	10.32	8.25	1,133.05	1,138.05	19.39	10.32	8.25	1,173.05	1,178.05	20.11	10.32	8.25
1,022.50	1,023.05	17.36	10.32	8.25	1,062.50	1,063.05	18.08	10.32	8.25	1,138.06	1,143.04	19.48	10.32	8.25	1,178.06	1,183.04	20.20	10.32	8.25
1,023.06	1,023.60	17.37	10.32	8.25	1,063.06	1,063.60	18.09	10.32	8.25	1,143.05	1,148.05	19.57	10.32	8.25	1,183.05	1,188.05	20.29	10.32	8.25
1,023.61	1,024.16	17.38	10.32	8.25	1,063.61	1,064.16	18.10	10.32	8.25	1,148.06	1,153.04	19.66	10.32	8.25	1,188.06	1,193.04	20.38	10.32	8.25
1,024.17	1,024.71	17.39	10.32	8.25	1,064.17	1,064.71	18.11	10.32	8.25	1,153.05	1,158.05	19.75	10.32	8.25	1,193.05	1,198.05	20.47	10.32	8.25
1,024.72	1,025.27	17.40	10.32	8.25	1,064.72	1,065.27	18.12	10.32	8.25	1,158.06	1,163.04	19.84	10.32	8.25	1,198.06	1,203.04	20.56	10.32	8.25
1,025.28	1,025.82	17.41	10.32	8.25	1,065.28	1,065.82	18.13	10.32	8.25	1,163.05	1,168.05	19.93	10.32	8.25	1,203.05	1,208.05	20.65	10.32	8.25
1,025.83	1,026.38	17.42	10.32	8.25	1,065.83	1,066.38	18.14	10.32	8.25	1,168.06	1,173.04	20.02	10.32	8.25	1,208.06	1,213.04	20.74	10.32	8.25
1,026.39	1,026.94	17.43	10.32	8.25	1,066.39	1,066.94	18.15	10.32	8.25	1,173.05	1,178.05	20.11	10.32	8.25	1,213.05	1,218.05	20.83	10.32	8.25
1,026.95	1,027.49	17.44	10.32	8.25	1,066.95	1,067.49	18.16	10.32	8.25	1,178.06	1,183.04	20.20	10.32	8.25	1,218.06	1,223.04	20.92	10.32	8.25
1,027.50	1,028.05	17.45	10.32	8.25	1,067.50	1,068.05	18.17	10.32	8.25	1,183.05	1,188.05	20.29	10.32	8.25	1,223.05	1,228.05	21.01	10.32	8.25
1,028.06	1,028.60	17.46	10.32	8.25	1,068.06	1,068.60	18.18	10.32	8.25	1,188.06	1,193.04	20.38	10.32	8.25	1,228.06	1,233.04	21.10	10.32	8.25
1,028.61	1,029.16	17.47	10.32	8.25	1,068.61	1,069.16	18.19	10.32	8.25	1,193.05	1,198.05	20.47	10.32	8.25	1,233.05	1,238.05	21.19	10.32	8.25
1,029.17	1,029.71	17.48	10.32	8.25	1,069.17	1,069.71	18.20	10.32	8.25	1,198.06	1,203.04	20.56	10.32	8.25	1,238.06	1,243.04	21.28	10.32	8.25
1,029.72	1,030.27	17.49	10.32	8.25	1,069.72	1,070.27	18.21	10.32	8.25	1,203.05	1,208.05	20.65	10.32	8.25	1,243.05	1,248.05	21.37	10.32	8.25
1,030.28	1,030.82	17.50	10.32	8.25	1,070.28	1,070.82	18.22	10.32	8.25	1,208.06	1,213.04	20.74	10.32	8.25	1,248.06	1,253.04	21.46	10.32	8.25
1,030.83	1,031.38	17.51	10.32	8.25	1,070.83	1,071.38	18.23	10.32	8.25	1,213.05	1,218.05	20.83	10.32	8.25	1,253.05	1,258.05	21.55	10.32	8.25
1,031.39	1,031.94	17.52	10.32	8.25	1,071.39	1,071.94	18.24	10.32	8.25	1,218.06	1,223.04	20.92	10.32	8.25	1,258.06	1,263.04	21.64	10.32	8.25
1,031.95	1,032.49	17.53	10.32	8.25	1,071.95	1,072.49	18.25	10.32	8.25	1,223.05	1,228.05	21.01	10.32	8.25	1,263.05	1,268.05	21.73	10.32	8.25
1,032.50	1,033.05	17.54	10.32	8.25	1,072.50	1,073.05	18.26	10.32	8.25	1,228.06	1,233.04	21.10	10.32	8.25	1,268.06	1,273.04	21.82	10.32	8.25
1,033.06	1,033.60	17.55	10.32	8.25	1,073.06	1,073.60	18.27	10.32	8.25	1,233.05	1,238.05	21.19	10.32	8.25	1,273.05	1,278.05	21.91	10.32	8.25
1,033.61	1,034.16	17.56	10.32	8.25	1,073.61	1,074.16	18.28	10.32	8.25	1,238.06	1,243.04	21.28	10.32	8.25	1,278.06	1,283.04	22.00	10.32	8.25
1,034.17	1,034.71	17.57	10.32	8.25	1,074.17	1,074.71	18.29	10.32	8.25	1,243.05	1,248.05	21.37	10.32	8.25	1,283.05	1,288.05	22.09	10.32	8.25
1,034.72	1,035.27	17.58	10.32	8.25	1,074.72	1,075.27	18.30	10.32	8.25	1,248.06	1,253.04	21.46	10.32	8.25	1,288.06	1,293.04	22.18	10.32	8.25
1,035.28	1,035.82	17.59	10.32	8.25	1,075.28	1,075.82	18.31	10.32	8.25	1,253.05	1,258.05	21.55	10.32	8.25	1,293.05	1,298.05	22.27	10.32	8.25
1,035.83	1,036.38	17.60	10.32	8.25	1,075.83	1,076.38	18.32	10.32	8.25	1,258.06	1,263.04	21.64	10.32	8.25	1,298.06	1,303.04	22.36	10.32	8.25
1,036.39	1,036.94	17.61	10.32	8.25	1,076.39	1,076.94	18.33	10.32	8.25	1,263.05	1,268.05	21.73	10.32	8.25	1,303.05	1,308.05	22.45	10.32	8.25
1,036.95	1,037.49	17.62	10.32	8.25	1,076.95	1,077.49	18.34	10.32	8.25	1,268.06	1,273.04	21.82	10.32	8.25	1,308.06	1,313.04	22.54	10.32	8.25
1,037.50	1,038.05	17.63	10.32	8.25	1,077.50	1,078.05	18.35	10.32	8.25	1,273.05	1,278.05	21.91	10.32	8.25	1,313.05	1,318.05	22.63	10.32	8.25
1,038.06	1,038.60	17.64	10.32	8.25	1,078.06	1,078.60	18.36	10.32	8.25	1,278.06	1,283.04	22.00	10.32	8.25	1,318.06	1,323.04	22.72	10.32	8.25
1,038.61	1,039.16	17.65	10.32	8.25	1,078.61	1,079.16	18.37	10.32	8.25	1,283.05	1,288.05	22.09	10.32	8.25	1,323.05	1,328.05	22.81	10.32	8.25
1,039.17	1,039.71	17.66	10.32	8.25	1,079.17	1,079.71	18.38	10.32	8.25	1,288.06	1,293.04	22.18	10.32	8.25	1,328.06	1,333.04	22.90	10.32	8.25
1,039.72	1,040.27	17.67	10.32	8.25	1,079.72	1,080.27	18.39	10.32	8.25	1,293.05	1,298.05	22.27	10.32	8.25	1,333.05	1,338.05	22.99	10.32	8.25
1,040.28	1,040.82	17.68	10.32	8.25	1,080.28	1,080.82	18.40	10.32	8.25	1,298.06	1,303.04	22.36	10.32	8.25	1,338.06	1,343.04	23.08	10.32	8.25
1,040.83	1,041.38	17.69	10.32	8.25	1,080.83	1,081.38	18.41	10.32	8.25	1,303.05	1,308.05	22.45	10.32	8.25	1,343.05	1,348.05	23.17	10.32	8.25
1,041.39	1,041.94	17.70	10.32	8.25	1,081.39	1,081.94	18.42	10.32	8.25	1,308.06	1,313.04	22.54	10.32	8.25	1,348.06	1,353.04	23.26	10.32	8.25
1,041.95	1,042.49	17.71	10.32	8.25	1,081.95	1,082.49	18.43	10.32	8.25	1,313.05	1,318.05	22.63	10.32	8.25	1,353.05	1,358.05	23.35	10.32	8.25
1,042.50	1,043.05	17.72	10.32	8.25	1,082.50	1,083.05	18.44	10.32	8.25	1,318.06	1,323.04	22.72	10.32	8.25	1,358.06	1,363.04	23.44	10.32	8.25
1,043.06	1,043.60	17.73	10.32	8.25	1,083.06	1,083.60	18.45	10.32	8.25	1,323.05	1,328.05	22.81	10.32	8.25	1,363.05	1,368.05	23.53	10.32	8.25
1,043.61	1,044.16	17.74	10.32	8.25	1,083.61	1,084.16	18.46	10.32	8.25	1,328.06	1,333.04	22.90	10.32	8.25	1,368.06	1,373.04	23.62	10.32	8.25
1,044.17	1,044.71	17.75	10.32	8.25	1,084.17	1,084.71	18.47	10.32	8.25	1,333.05	1,338.05	22.99	10.32	8.25	1,373.05	1,378.05	23.71	10.32	8.25
1,044.72	1,045.27	17.76	10.32	8.25	1,084.72	1,085.27	18.48	10.32	8.25	1,338.06	1,343.04	23.08	10.32	8.25	1,378.06	1,383.04	23.80	10.32	8.25

TABLE VIII

WEEKLY TAX DEDUCTIONS
Basis—52 Pay Periods per Year

WEEKLY PAY Use appropriate bracket PAIE PAR SEMAINE Utilisez le palier approprié	IF THE CLAIM FOR EXEMPTIONS ON FORM TDI IS—SI LA DEMANDE D'EXEMPTIONS SELON LA FORMULE TDI EST DE														See note on page 46 Remarque p. 46	
	DEDUCT FROM EACH PAY—DÉDUISEZ SUR CHAQUE PAIE															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	\$1,706– \$1,799	\$1,800– \$1,999	\$2,000– \$2,199	\$2,200– \$2,399	\$2,400– \$2,599	\$2,600– \$2,799	\$2,800– \$2,999	\$3,000– \$3,197	\$3,198– \$3,399	\$3,400– \$3,599	\$3,600– \$3,799	\$3,800– \$4,099	\$4,100– \$4,399			
Under—Moins de																
\$40.00	.00	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05			
\$40.00 – \$41.99	.25	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10			
\$42.00 – \$43.99	.30	.20	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05			
\$44.00 – \$45.99	.40	.25	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10			
\$46.00 – \$47.99	.50	.35	.20	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05			
\$48.00 – \$49.99	.70	.50	.35	.20	.05	.05	.05	.05	.05	.05	.05	.05	.05			
\$50.00 – \$51.99	.85	.60	.45	.30	.15	.10	.10	.10	.10	.10	.10	.10	.10			
\$52.00 – \$53.99	1.05	.75	.60	.45	.30	.15	.10	.10	.10	.10	.10	.10	.10			
\$54.00 – \$55.99	1.25	.95	.80	.65	.50	.35	.20	.15	.15	.15	.15	.15	.15			
\$56.00 – \$57.99	1.45	1.15	1.00	.85	.70	.55	.40	.25	.25	.25	.25	.25	.25			
\$58.00 – \$59.99	1.65	1.35	1.20	1.05	.90	.75	.60	.45	.45	.45	.45	.45	.45			
\$60.00 – \$61.99	1.85	1.55	1.40	1.25	1.10	.95	.80	.65	.65	.65	.65	.65	.65			
\$62.00 – \$63.99	2.05	1.75	1.60	1.45	1.30	1.15	.95	.80	.80	.80	.80	.80	.80			
\$64.00 – \$65.99	2.25	1.95	1.80	1.65	1.50	1.35	1.15	.95	.95	.95	.95	.95	.95			
\$66.00 – \$67.99	2.45	2.15	2.00	1.85	1.70	1.55	1.35	1.15	1.15	1.15	1.15	1.15	1.15			
\$68.00 – \$69.99	2.65	2.35	2.20	2.05	1.90	1.75	1.55	1.35	1.35	1.35	1.35	1.35	1.35			
\$70.00 – \$71.99	2.85	2.55	2.40	2.25	2.10	1.95	1.75	1.55	1.55	1.55	1.55	1.55	1.55			
\$72.00 – \$73.99	3.05	2.75	2.60	2.45	2.30	2.15	1.95	1.75	1.75	1.75	1.75	1.75	1.75			
\$74.00 – \$75.99	3.25	2.95	2.80	2.65	2.50	2.35	2.15	1.95	1.95	1.95	1.95	1.95	1.95			
\$76.00 – \$77.99	3.45	3.15	3.00	2.85	2.70	2.55	2.35	2.15	2.15	2.15	2.15	2.15	2.15			
\$78.00 – \$79.99	3.65	3.35	3.20	3.05	2.90	2.75	2.55	2.35	2.35	2.35	2.35	2.35	2.35			
\$80.00 – \$81.99	3.85	3.55	3.40	3.25	3.10	2.95	2.75	2.55	2.55	2.55	2.55	2.55	2.55			
\$82.00 – \$83.99	4.05	3.75	3.60	3.45	3.30	3.15	2.95	2.75	2.75	2.75	2.75	2.75	2.75			
\$84.00 – \$85.99	4.25	3.95	3.80	3.65	3.50	3.35	3.15	2.95	2.95	2.95	2.95	2.95	2.95			
\$86.00 – \$87.99	4.45	4.15	4.00	3.85	3.70	3.55	3.35	3.15	3.15	3.15	3.15	3.15	3.15			
\$88.00 – \$89.99	4.65	4.35	4.20	4.05	3.90	3.75	3.55	3.35	3.35	3.35	3.35	3.35	3.35			
\$90.00 – \$91.99	4.85	4.55	4.40	4.25	4.10	3.95	3.75	3.55	3.55	3.55	3.55	3.55	3.55			
\$92.00 – \$93.99	5.05	4.75	4.60	4.45	4.30	4.15	3.95	3.75	3.75	3.75	3.75	3.75	3.75			
\$94.00 – \$95.99	5.25	4.95	4.80	4.65	4.50	4.35	4.15	3.95	3.95	3.95	3.95	3.95	3.95			
\$96.00 – \$97.99	5.45	5.15	5.00	4.85	4.70	4.55	4.35	4.15	4.15	4.15	4.15	4.15	4.15			
\$98.00 – \$99.99	5.65	5.35	5.20	5.05	4.90	4.75	4.55	4.35	4.35	4.35	4.35	4.35	4.35			
\$100.00 – \$101.99	5.85	5.55	5.40	5.25	5.10	4.95	4.75	4.55	4.55	4.55	4.55	4.55	4.55			
\$102.00 – \$103.99	6.05	5.75	5.60	5.45	5.30	5.15	4.95	4.75	4.75	4.75	4.75	4.75	4.75			
\$104.00 – \$105.99	6.25	5.95	5.80	5.65	5.50	5.35	5.15	4.95	4.95	4.95	4.95	4.95	4.95			
\$106.00 – \$107.99	6.45	6.15	6.00	5.85	5.70	5.55	5.35	5.15	5.15	5.15	5.15	5.15	5.15			
\$108.00 – \$109.99	6.65	6.35	6.20	6.05	5.90	5.75	5.55	5.35	5.35	5.35	5.35	5.35	5.35			
\$110.00 – \$111.99	6.85	6.55	6.40	6.25	6.10	5.95	5.75	5.55	5.55	5.55	5.55	5.55	5.55			
\$112.00 – \$113.99	7.05	6.75	6.60	6.45	6.30	6.15	5.95	5.75	5.75	5.75	5.75	5.75	5.75			
\$114.00 – \$115.99	7.25	6.95	6.80	6.65	6.50	6.35	6.15	5.95	5.95	5.95	5.95	5.95	5.95			
\$116.00 – \$117.99	7.45	7.15	7.00	6.85	6.70	6.55	6.35	6.15	6.15	6.15	6.15	6.15	6.15			
\$118.00 – \$119.99	7.65	7.35	7.20	7.05	6.90	6.75	6.55	6.35	6.35	6.35	6.35	6.35	6.35			
\$120.00 – \$121.99	7.85	7.55	7.40	7.25	7.10	6.95	6.75	6.55	6.55	6.55	6.55	6.55	6.55			
\$122.00 – \$123.99	8.05	7.75	7.60	7.45	7.30	7.15	6.95	6.75	6.75	6.75	6.75	6.75	6.75			
\$124.00 – \$125.99	8.25	7.95	7.80	7.65	7.50	7.35	7.15	6.95	6.95	6.95	6.95	6.95	6.95			
\$126.00 – \$127.99	8.45	8.15	8.00	7.85	7.70	7.55	7.35	7.15	7.15	7.15	7.15	7.15	7.15			
\$128.00 – \$129.99	8.65	8.35	8.20	8.05	7.90	7.75	7.55	7.35	7.35	7.35	7.35	7.35	7.35			
\$130.00 – \$131.99	8.85	8.55	8.40	8.25	8.10	7.95	7.75	7.55	7.55	7.55	7.55	7.55	7.55			
\$132.00 – \$133.99	9.05	8.75	8.60	8.45	8.30	8.15	7.95	7.75	7.75	7.75	7.75	7.75	7.75			
\$134.00 – \$135.99	9.25	8.95	8.80	8.65	8.50	8.35	8.15	7.95	7.95	7.95	7.95	7.95	7.95			
\$136.00 – \$137.99	9.45	9.15	9.00	8.85	8.70	8.55	8.35	8.15	8.15	8.15	8.15	8.15	8.15			
\$138.00 – \$139.99	9.65	9.35	9.20	9.05	8.90	8.75	8.55	8.35	8.35	8.35	8.35	8.35	8.35			
\$140.00 – \$141.99	9.85	9.55	9.40	9.25	9.10	8.95	8.75	8.55	8.55	8.55	8.55	8.55	8.55			
\$142.00 – \$143.99	10.05	9.75	9.60	9.45	9.30	9.15	8.95	8.75	8.75	8.75	8.75	8.75	8.75			
\$144.00 – \$145.99	10.25	9.95	9.80	9.65	9.50	9.35	9.15	8.95	8.95	8.95	8.95	8.95	8.95			
\$146.00 – \$147.99	10.45	10.15	10.00	9.85	9.70	9.55	9.35	9.15	9.15	9.15	9.15	9.15	9.15			
\$148.00 – \$149.99	10.65	10.35	10.20	10.05	9.90	9.75	9.55	9.35	9.35	9.35	9.35	9.35	9.35			
\$150.00 – \$151.99	10.85	10.55	10.40	10.25	10.10	9.95	9.75	9.55	9.55	9.55	9.55	9.55	9.55			
\$152.00 – \$153.99	11.05	10.75	10.60	10.45	10.30	10.15	9.95	9.75	9.75	9.75	9.75	9.75	9.75			
\$154.00 – \$155.99	11.25	10.95	10.80	10.65	10.50	10.35	10.15	9.95	9.95	9.95	9.95	9.95	9.95			
\$156.00 – \$157.99	11.45	11.15	11.00	10.85	10.70	10.55	10.35	10.15	10.15	10.15	10.15	10.15	10.15			
\$158.00 – \$159.99	11.65	11.35	11.20	11.05	10.90	10.75	10.55	10.35	10.35	10.35	10.35	10.35	10.35			
\$160.00 – \$161.99	11.85	11.55	11.40	11.25	11.10	10.95	10.75	10.55	10.55	10.55	10.55	10.55	10.55			
\$162.00 – \$163.99	12.05	11.75	11.60	11.45	11.30	11.15	10.95	10.75	10.75	10.75	10.75	10.75	10.75			
\$164.00 – \$165.99	12.25	11.95	11.80	11.65	11.50	11.35	11.15	10.95	10.95	10.95	10.95	10.95	10.95			
\$166.00 – \$167.99	12.45	12.15	12.00	11.85	11.70	11.55	11.35	11.15	11.15	11.15	11.15	11.15	11.15			
\$168.00 – \$169.99	12.65	12.35	12.20	12.05	11.90	11.75	11.55	11.35	11.35	11.35	11.35	11.35	11.35			
\$170.00 – \$171.99	12.85	12.55	12.40	12.25	12.10	11.95	11.75	11.55	11.55	11.55	11.55	11.55	11.55			
\$172.00 – \$173.99	13.05	12.75	12.60	12.45	12.30	12.15	11.95	11.75	11.75	11.75	11.75	11.75	11.75			
\$174.00 – \$175.99	13.25	12.95	12.80	12.65	12.50	12.35	12.15	11.95	11.95	11.95	11.95	11.95	11.95			
\$176.00 – \$177.99	13.45	13.15	13.00	12.85	12.70	12.55	12.35	12.15	12.15	12.15	12.15	12.15	12.15			
\$178.00 – \$179.99	13.65	13.35	13.20	13.05	12.90	12.75	12.55	12.35	12.35	12.35	12.35	12.35	12.35			
\$180.00 – \$181.99	13.85	13.55	13.40	13.25	13.10	12.95	12.75	12.55	12.55	12.55	12.55	12.55	12.55			
\$182.00 – \$183.99	14.05	13.75	13.60	13.45	13.30	13.15	12.95	12.75	12.75	12.75	12.75	12.75	12.75			
\$184.00 – \$185.99	14.25	13.95	13.80	13.65	13.50	13.35	13.15	12.95	12.95	12.95	12.95	12.95	12.95			
\$186.00 – \$187.99	14.45	14.15	14.00	13.85	13.70	13.55	13.35	13.15	13.15	13.15	13.15	13.15	13.15			
\$188.00 – \$189.99	14.65	14.35	14.20	14.05	13.90	13.75	13.55	13.35	13.35	13.35	13.35	13.35	13.35			
\$190.00 – \$191.99	14.85	14.55	14.40	14.25	14.10	13.95	13.75	13.55	13.55	13.55	13.55	13.55	13.55			
\$192.00 – \$193.99	15.05	14.75	14.60	14.45	14.30	14.15	13.95	13.75	13.75	13.75	13.75	13.75	13.75			
\$194.00 – \$195.99	15.25	14.95	14.80	14.65	14.50	14.35	14.15	13.9								

TABLE VIII, continued

WEEKLY TAX DEDUCTIONS
Basis—52 Pay Periods per Year

WEEKLY PAY Une approuvée bruct PAIE PAR SEMAINE Utilisez le paller approuvé		IF THE CLAIM FOR EXEMPTIONS ON FORM TDI IS — SI LA DEMANDE D'EXEMPTIONS SELON LA FORMULE TDI EST DE —													See note on page 14. Voir remarque p. 14.	
\$1,700— \$1,799	\$1,800— \$1,999	\$2,000— \$2,199	\$2,200— \$2,399	\$2,400— \$2,599	\$2,600— \$2,799	\$2,800— \$2,999	\$3,000— \$3,197	\$3,198— \$3,399	\$3,400— \$3,599	\$3,600— \$3,799	\$3,800— \$3,999	\$4,000— \$4,199	\$4,200— \$4,399	\$4,400— \$4,599	\$4,600— \$4,799	\$4,800— \$4,999
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
\$ 118.00 — 119.99	17.95	16.95	15.90	14.85	13.80	12.75	11.70	10.70	9.70	8.70	7.70	6.70	5.30	1.45	5.30	1.45
120.00 — 121.99	18.50	17.50	16.45	15.40	14.35	13.30	12.25	11.25	10.25	9.25	8.25	7.20	5.80	1.45	5.80	1.45
122.00 — 123.99	19.05	18.05	17.00	15.95	14.90	13.85	12.80	11.75	10.75	9.75	8.75	7.75	6.30	1.45	6.30	1.45
124.00 — 125.99	19.60	18.60	17.55	16.50	15.45	14.40	13.35	12.30	11.30	10.25	9.25	8.25	6.80	1.50	6.80	1.50
126.00 — 127.99	20.15	19.15	18.10	17.05	16.00	14.95	13.90	12.85	11.80	10.75	9.70	8.70	7.30	1.50	7.30	1.50
128.00 — 129.99	20.70	19.70	18.65	17.60	16.55	15.50	14.45	13.40	12.35	11.30	10.30	9.30	7.90	1.50	7.90	1.50
130.00 — 131.99	21.25	20.25	19.20	18.15	17.10	16.05	15.00	13.95	12.90	11.85	10.85	9.85	8.45	1.50	8.45	1.50
132.00 — 133.99	21.80	20.80	19.75	18.70	17.65	16.60	15.55	14.50	13.45	12.40	11.35	10.35	8.95	1.50	8.95	1.50
134.00 — 135.99	22.35	21.35	20.30	19.25	18.20	17.15	16.10	15.05	14.00	12.95	11.90	10.90	9.50	1.55	9.50	1.55
136.00 — 137.99	22.90	21.90	20.85	19.80	18.75	17.70	16.65	15.60	14.55	13.50	12.45	11.40	10.00	1.55	10.00	1.55
138.00 — 139.99	23.45	22.45	21.40	20.35	19.30	18.25	17.20	16.15	15.10	14.05	13.00	11.95	10.55	1.55	10.55	1.55
140.00 — 141.99	24.00	23.00	21.95	20.90	19.85	18.80	17.75	16.70	15.65	14.60	13.55	12.50	11.10	1.55	11.10	1.55
142.00 — 143.99	24.55	23.55	22.50	21.45	20.40	19.35	18.30	17.25	16.20	15.15	14.10	13.05	11.65	1.55	11.65	1.55
144.00 — 145.99	25.10	24.10	23.05	22.00	20.95	19.90	18.85	17.80	16.75	15.70	14.65	13.60	12.20	1.60	12.20	1.60
146.00 — 147.99	25.65	24.65	23.60	22.55	21.50	20.45	19.40	18.35	17.30	16.25	15.20	14.15	12.75	1.60	12.75	1.60
148.00 — 149.99	26.20	25.20	24.15	23.10	22.05	21.00	19.95	18.90	17.85	16.80	15.75	14.70	13.30	1.60	13.30	1.60
150.00 — 151.99	26.75	25.75	24.70	23.65	22.60	21.55	20.50	19.45	18.40	17.35	16.30	15.25	13.85	1.60	13.85	1.60
152.00 — 153.99	27.30	26.30	25.25	24.20	23.15	22.10	21.05	20.00	18.95	17.90	16.85	15.80	14.40	1.60	14.40	1.60
154.00 — 155.99	27.85	26.85	25.80	24.75	23.70	22.65	21.60	20.55	19.50	18.45	17.40	16.35	14.95	1.60	14.95	1.60
156.00 — 157.99	28.40	27.40	26.35	25.30	24.25	23.20	22.15	21.10	20.05	19.00	17.95	16.90	15.50	1.60	15.50	1.60
158.00 — 159.99	28.95	27.95	26.90	25.85	24.80	23.75	22.70	21.65	20.60	19.55	18.50	17.45	16.05	1.60	16.05	1.60
160.00 — 161.99	29.50	28.50	27.45	26.40	25.35	24.30	23.25	22.20	21.15	20.10	19.05	18.00	16.60	1.60	16.60	1.60
162.00 — 163.99	30.05	29.05	28.00	26.95	25.90	24.85	23.80	22.75	21.70	20.65	19.60	18.55	17.15	1.60	17.15	1.60
164.00 — 165.99	31.20	30.10	28.95	27.80	26.65	25.50	24.30	23.15	22.00	20.85	19.70	18.60	17.20	1.60	17.20	1.60
166.00 — 167.99	31.60	30.70	29.55	28.40	27.25	26.10	24.90	23.75	22.60	21.45	20.30	19.20	17.80	1.60	17.80	1.60
168.00 — 169.99	32.40	31.30	30.15	29.00	27.85	26.70	25.50	24.35	23.20	22.05	20.90	19.80	18.40	1.60	18.40	1.60
170.00 — 171.99	33.45	32.35	31.20	30.05	28.90	27.75	26.60	25.40	24.25	23.10	21.95	20.85	19.45	1.60	19.45	1.60
172.00 — 173.99	34.50	33.40	32.25	31.10	30.00	28.85	27.70	26.55	25.40	24.25	23.10	22.00	20.60	1.60	20.60	1.60
174.00 — 175.99	35.55	34.45	33.30	32.15	31.00	29.85	28.70	27.55	26.40	25.25	24.10	23.00	21.60	1.60	21.60	1.60
176.00 — 177.99	36.60	35.50	34.35	33.20	32.05	30.90	29.75	28.60	27.45	26.30	25.15	24.05	22.65	1.60	22.65	1.60
178.00 — 179.99	37.65	36.55	35.40	34.25	33.10	31.95	30.80	29.65	28.50	27.35	26.20	25.10	23.70	1.60	23.70	1.60
180.00 — 181.99	38.70	37.60	36.45	35.30	34.15	33.00	31.85	30.70	29.55	28.40	27.25	26.15	24.75	1.60	24.75	1.60
182.00 — 183.99	39.75	38.65	37.50	36.35	35.20	34.05	32.90	31.75	30.60	29.45	28.30	27.20	25.80	1.60	25.80	1.60
184.00 — 185.99	40.80	39.70	38.55	37.40	36.25	35.10	33.95	32.80	31.65	30.50	29.35	28.25	26.85	1.60	26.85	1.60
186.00 — 187.99	41.85	40.75	39.60	38.45	37.30	36.15	35.00	33.85	32.70	31.55	30.40	29.30	27.90	1.60	27.90	1.60
188.00 — 189.99	42.90	41.80	40.65	39.50	38.35	37.20	36.05	34.90	33.75	32.60	31.45	30.35	28.95	1.60	28.95	1.60
190.00 — 191.99	43.95	42.85	41.70	40.55	39.40	38.25	37.10	35.95	34.80	33.65	32.50	31.40	30.00	1.60	30.00	1.60
192.00 — 193.99	45.00	43.90	42.75	41.60	40.45	39.30	38.15	37.00	35.85	34.70	33.55	32.45	31.05	1.60	31.05	1.60
194.00 — 195.99	46.05	44.95	43.80	42.65	41.50	40.35	39.20	38.05	36.90	35.75	34.60	33.50	32.10	1.60	32.10	1.60
196.00 — 197.99	47.10	46.00	44.85	43.70	42.55	41.40	40.25	39.10	37.95	36.80	35.65	34.55	33.15	1.60	33.15	1.60
198.00 — 199.99	48.15	47.05	45.90	44.75	43.60	42.45	41.30	40.15	39.00	37.85	36.70	35.60	34.20	1.60	34.20	1.60
200.00 — 201.99	49.20	48.10	46.95	45.80	44.65	43.50	42.35	41.20	40.05	38.90	37.75	36.65	35.25	1.60	35.25	1.60
202.00 — 203.99	50.25	49.15	48.00	46.85	45.70	44.55	43.40	42.25	41.10	40.00	38.85	37.75	36.35	1.60	36.35	1.60
204.00 — 205.99	51.30	50.20	49.05	47.90	46.75	45.60	44.45	43.30	42.15	41.00	39.85	38.75	37.35	1.60	37.35	1.60
206.00 — 207.99	52.35	51.25	50.10	48.95	47.80	46.65	45.50	44.35	43.20	42.05	40.90	39.80	38.40	1.60	38.40	1.60
208.00 — 209.99	53.40	52.30	51.15	50.00	48.85	47.70	46.55	45.40	44.25	43.10	41.95	40.85	39.45	1.60	39.45	1.60
210.00 — 211.99	54.45	53.35	52.20	51.05	49.90	48.75	47.60	46.45	45.30	44.15	43.00	41.90	40.50	1.60	40.50	1.60
212.00 — 213.99	55.50	54.40	53.25	52.10	50.95	49.80	48.65	47.50	46.35	45.20	44.05	42.95	41.55	1.60	41.55	1.60
214.00 — 215.99	56.55	55.45	54.30	53.15	52.00	50.85	49.70	48.55	47.40	46.25	45.10	44.00	42.60	1.60	42.60	1.60
216.00 — 217.99	57.60	56.50	55.35	54.20	53.05	51.90	50.75	49.60	48.45	47.30	46.15	45.05	43.65	1.60	43.65	1.60
218.00 — 219.99	58.65	57.55	56.40	55.25	54.10	52.95	51.80	50.65	49.50	48.35	47.20	46.10	44.70	1.60	44.70	1.60
220.00 — 221.99	59.70	58.60	57.45	56.30	55.15	54.00	52.85	51.70	50.55	49.40	48.25	47.15	45.75	1.60	45.75	1.60
222.00 — 223.99	60.75	59.65	58.50	57.35	56.20	55.05	53.90	52.75	51.60	50.45	49.30	48.20	46.80	1.60	46.80	1.60
224.00 — 225.99	61.80	60.70	59.55	58.40	57.25	56.10	54.95	53.80	52.65	51.50	50.35	49.25	47.85	1.60	47.85	1.60
226.00 — 227.99	62.85	61.75	60.60	59.45	58.30	57.15	56.00	54.85	53.70	52.55	51.40	50.30	48.90	1.60	48.90	1.60
228.00 — 229.99	63.90	62.80	61.65	60.50	59.35	58.20	57.05	55.90	54.75	53.60	52.45	51.35	49.95	1.60	49.95	1.60
230.00 — 231.99	64.95	63.85	62.70	61.55	60.40	59.25	58.10	56.95	55.80	54.65	53.50	52.40	51.00	1.60	51.00	1.60
232.00 — 233.99	66.00	64.90	63.75	62.60	61.45	60.30	59.15	58.00	56.85	55.70	54.55	53.45	52.05	1.60	52.05	1.60
234.00 — 235.99	67.05	65.95	64.80	63.65	62.50	61.35	60.20	59.05	57.90	56.75	55.60	54.50	53.10	1.60	53.10	1.60
236.00 — 237.99	68.10	67.00	65.85	64.70	63.55	62.40	61.25	60.10	58.95	57.80	56.65	55.55	54.15	1.60	54.15	1.60
238.00 — 239.99	69.15	68.05	66.90	65.75	64.60	63.45	62.30	61.15	60.00	58.85	57.70	56.60	55.20	1.60	55.20	1.60
240.00 — 241.99	70.20	69.10	67.95	66.80	65.65	64.50	63.35	62.20	61.05	59.90	58.75	57.65	56.25	1.60	56.25	1.60
242.00 — 243.99	71.25	70.15	69.00	67.85	66.70	65.55	64.40	63.25	62.10	60.95	59.80	58.70	57.30	1.60	57.30	1.60
244.00 — 245.99	72.30	71.20	70.05	68.90	67.75	66.60	65.45	64.30	63.15	62.00	60.85	59.75	58.35</			

EMPLOYEE'S CANADA PENSION PLAN CONTRIBUTION TABLE

How to use the Contribution Table

1. Calculate your 'Earnings Subject to Contribution' (Total Contributory Earnings per T4 slips less Basic Canada Pension Plan Exemption). To do so, use the area on page 3 of the form headed 'Calculation of Canada Pension Plan Overpayment'.

2. From the Contribution Table below, select the range in which the amount of

your 'Earnings Subject to Contribution' falls and note the amount of your 'Required Contribution' which appears in the column to the right.

3. Compare your 'Required Contribution' with the total contribution withheld per T4 slips. If the amounts differ, refer to the Guide—item 25.

Earnings Subject to Contribution: over not over	Employee's Required Contribution	Earnings Subject to Contribution: over not over	Employee's Required Contribution	Earnings Subject to Contribution: over not over	Employee's Required Contribution	Earnings Subject to Contribution: over not over	Employee's Required Contribution
\$ 0- 10	\$ 09	\$ 600- 610	\$ 10.89	\$1200-1210	\$ 21.69	\$1800-1810	\$ 32.49
10- 20	27	610- 620	11.07	1210-1220	21.87	1810-1820	32.67
20- 30	45	620- 630	11.25	1220-1230	22.05	1820-1830	32.85
30- 40	63	630- 640	11.43	1230-1240	22.23	1830-1840	33.03
40- 50	81	640- 650	11.61	1240-1250	22.41	1840-1850	33.21
50- 60	99	650- 660	11.79	1250-1260	22.59	1850-1860	33.39
60- 70	1 17	660- 670	11.97	1260-1270	22.77	1860-1870	33.57
70- 80	1 35	670- 680	12.15	1270-1280	22.95	1870-1880	33.75
80- 90	1 53	680- 690	12.33	1280-1290	23.13	1880-1890	33.93
90-100	1 71	690- 700	12.51	1290-1300	23.31	1890-1900	34.11
\$ 100- 110	\$ 1 89	\$ 700- 710	\$ 12.69	\$1300-1310	\$ 23.49	\$1900-1910	\$ 34.29
110- 120	2 07	710- 720	12.87	1310-1320	23.67	1910-1920	34.47
120- 130	2 25	720- 730	13.05	1320-1330	23.85	1920-1930	34.65
130- 140	2 43	730- 740	13.23	1330-1340	24.03	1930-1940	34.83
140- 150	2 61	740- 750	13.41	1340-1350	24.21	1940-1950	35.01
150- 160	2 79	750- 760	13.59	1350-1360	24.39	1950-1960	35.19
160- 170	2 97	760- 770	13.77	1360-1370	24.57	1960-1970	35.37
170- 180	3 15	770- 780	13.95	1370-1380	24.75	1970-1980	35.55
180- 190	3 33	780- 790	14.13	1380-1390	24.93	1980-1990	35.73
190- 200	3 51	790- 800	14.31	1390-1400	25.11	1990-2000	35.91
\$ 200- 210	\$ 3 69	\$ 800- 810	\$ 14.49	\$1400-1410	\$ 25.29	\$2000-2010	\$ 36.09
210- 220	3 87	810- 820	14.67	1410-1420	25.47	2010-2020	36.27
220- 230	4 05	820- 830	14.85	1420-1430	25.65	2020-2030	36.45
230- 240	4 23	830- 840	15.03	1430-1440	25.83	2030-2040	36.63
240- 250	4 41	840- 850	15.21	1440-1450	26.01	2040-2050	36.81
250- 260	4 59	850- 860	15.39	1450-1460	26.19	2050-2060	36.99
260- 270	4 77	860- 870	15.57	1460-1470	26.37	2060-2070	37.17
270- 280	4 95	870- 880	15.75	1470-1480	26.55	2070-2080	37.35
280- 290	5 13	880- 890	15.93	1480-1490	26.73	2080-2090	37.53
290- 300	5 31	890- 900	16.11	1490-1500	26.91	2090-2100	37.71
\$ 300- 310	\$ 5 49	\$ 900- 910	\$ 16.29	\$1500-1510	\$ 27.09	\$2100-2110	\$ 37.89
310- 320	5 67	910- 920	16.47	1510-1520	27.27	2110-2120	38.07
320- 330	5 85	920- 930	16.65	1520-1530	27.45	2120-2130	38.25
330- 340	6 03	930- 940	16.83	1530-1540	27.63	2130-2140	38.43
340- 350	6 21	940- 950	17.01	1540-1550	27.81	2140-2150	38.61
350- 360	6 39	950- 960	17.19	1550-1560	27.99	2150-2160	38.79
360- 370	6 57	960- 970	17.37	1560-1570	28.17	2160-2170	38.97
370- 380	6 75	970- 980	17.55	1570-1580	28.35	2170-2180	39.15
380- 390	6 93	980- 990	17.73	1580-1590	28.53	2180-2190	39.33
390- 400	7 11	990-1000	17.91	1590-1600	28.71	2190-2200	39.51
\$ 400- 410	\$ 7 29	\$1000-1010	\$ 18.09	\$1600-1610	\$ 28.89	\$2200-2210	\$ 39.69
410- 420	7 47	1010-1020	18.27	1610-1620	29.07	2210-2220	39.87
420- 430	7 65	1020-1030	18.45	1620-1630	29.25	2220-2230	40.05
430- 440	7 83	1030-1040	18.63	1630-1640	29.43	2230-2240	40.23
440- 450	8 01	1040-1050	18.81	1640-1650	29.61	2240-2250	40.41
450- 460	8 19	1050-1060	18.99	1650-1660	29.79	2250-2260	40.59
460- 470	8 37	1060-1070	19.17	1660-1670	29.97	2260-2270	40.77
470- 480	8 55	1070-1080	19.35	1670-1680	30.15	2270-2280	40.95
480- 490	8 73	1080-1090	19.53	1680-1690	30.33	2280-2290	41.13
490- 500	8.91	1090-1100	19.71	1690-1700	30.51	2290-2300	41.31
\$ 500- 510	\$ 9 09	\$1100-1110	\$ 19.89	\$1700-1710	\$ 30.69	\$2300-2310	\$ 41.49
510- 520	9 27	1110-1120	20.07	1710-1720	30.87	2310-2320	41.67
520- 530	9 45	1120-1130	20.25	1720-1730	31.05	2320-2330	41.85
530- 540	9 63	1130-1140	20.43	1730-1740	31.23	2330-2340	42.03
540- 550	9 81	1140-1150	20.61	1740-1750	31.41	2340-2350	42.21
550- 560	9 99	1150-1160	20.79	1750-1760	31.59	2350-2360	42.39
560- 570	10 17	1160-1170	20.97	1760-1770	31.77	2360-2370	42.57
570- 580	10 35	1170-1180	21.15	1770-1780	31.95	2370-2380	42.75
580- 590	10 53	1180-1190	21.33	1780-1790	32.13	2380-2390	42.93
590- 600	10 71	1190-1200	21.51	1790-1800	32.31	2390-2400	43.11

TABLE XI, continued

Earnings Subject to Contribution: over not over	Employee's Required Contribution	Earnings Subject to Contribution: over not over	Employee's Required Contribution	Earnings Subject to Contribution: over not over	Employee's Required Contribution	Earnings Subject to Contribution: over not over	Employee's Required Contribution
\$2400-2410	\$ 43 29	\$3200-3210	\$ 57 69	\$4000-4010	\$ 72 09	\$4800-4810	\$ 86 49
2410-2420	43 47	3210-3220	57 87	4010-4020	72 27	4810-4820	86 67
2420-2430	43 65	3220-3230	58 05	4020-4030	72 45	4820-4830	86 85
2430-2440	43 83	3230-3240	58 23	4030-4040	72 63	4830-4840	87 03
2440-2450	44 01	3240-3250	58 41	4040-4050	72 81	4840-4850	87 21
2450-2460	44 19	3250-3260	58 59	4050-4060	72 99	4850-4860	87 39
2460-2470	44 37	3260-3270	58 77	4060-4070	73 17	4860-4870	87 57
2470-2480	44 55	3270-3280	58 95	4070-4080	73 35	4870-4880	87 75
2480-2490	44 73	3280-3290	59 13	4080-4090	73 53	4880-4890	87 93
2490-2500	44 91	3290-3300	59 31	4090-4100	73 71	4890-4900	88 11
\$2500-2510	\$ 45 09	\$3300-3310	\$ 59 49	\$4100-4110	\$ 73 89	\$4900-4910	\$ 88 29
2510-2520	45 27	3310-3320	59 67	4110-4120	74 07	4910-4920	88 47
2520-2530	45 45	3320-3330	59 85	4120-4130	74 25	4920-4930	88 65
2530-2540	45 63	3330-3340	60 03	4130-4140	74 43	4930-4940	88 83
2540-2550	45 81	3340-3350	60 21	4140-4150	74 61	4940-4950	89 01
2550-2560	45 99	3350-3360	60 39	4150-4160	74 79	4950-4960	89 19
2560-2570	46 17	3360-3370	60 57	4160-4170	74 97	4960-4970	89 37
2570-2580	46 35	3370-3380	60 75	4170-4180	75 15	4970-4980	89 55
2580-2590	46 53	3380-3390	60 93	4180-4190	75 33	4980-4990	89 73
2590-2600	46 71	3390-3400	61 11	4190-4200	75 51	4990-5000	89 91
\$2600-2610	\$ 46 89	\$3400-3410	\$ 61 29	\$4200-4210	\$ 75 69	\$5000-5010	\$ 90 09
2610-2620	47 07	3410-3420	61 47	4210-4220	75 87	5010-5020	90 27
2620-2630	47 25	3420-3430	61 65	4220-4230	76 05	5020-5030	90 45
2630-2640	47 43	3430-3440	61 83	4230-4240	76 23	5030-5040	90 63
2640-2650	47 61	3440-3450	62 01	4240-4250	76 41	5040-5050	90 81
2650-2660	47 79	3450-3460	62 19	4250-4260	76 59	5050-5060	90 99
2660-2670	47 97	3460-3470	62 37	4260-4270	76 77	5060-5070	91 17
2670-2680	48 15	3470-3480	62 55	4270-4280	76 95	5070-5080	91 35
2680-2690	48 33	3480-3490	62 73	4280-4290	77 13	5080-5090	91 53
2690-2700	48 51	3490-3500	62 91	4290-4300	77 31	5090-5100	91 71
\$2700-2710	\$ 48 69	\$3500-3510	\$ 63 09	\$4300-4310	\$ 77 49	\$5100-5110	\$ 91 89
2710-2720	48 87	3510-3520	63 27	4310-4320	77 67	5110-5120	92 07
2720-2730	49 05	3520-3530	63 45	4320-4330	77 85	5120-5130	92 25
2730-2740	49 23	3530-3540	63 63	4330-4340	78 03	5130-5140	92 43
2740-2750	49 41	3540-3550	63 81	4340-4350	78 21	5140-5150	92 61
2750-2760	49 59	3550-3560	63 99	4350-4360	78 39	5150-5160	92 79
2760-2770	49 77	3560-3570	64 17	4360-4370	78 57	5160-5170	92 97
2770-2780	49 95	3570-3580	64 35	4370-4380	78 75	5170-5180	93 15
2780-2790	50 13	3580-3590	64 53	4380-4390	78 93	5180-5190	93 33
2790-2800	50 31	3590-3600	64 71	4390-4400	79 11	5190-5200	93 51
\$2800-2810	\$ 50 49	\$3600-3610	\$ 64 89	\$4400-4410	\$ 79 29	\$5200-5210	\$ 93 69
2810-2820	50 67	3610-3620	65 07	4410-4420	79 47	5210-5220	93 87
2820-2830	50 85	3620-3630	65 25	4420-4430	79 65	5220-5230	94 05
2830-2840	51 03	3630-3640	65 43	4430-4440	79 83	5230-5240	94 23
2840-2850	51 21	3640-3650	65 61	4440-4450	80 01	5240-5250	94 41
2850-2860	51 39	3650-3660	65 79	4450-4460	80 19	5250-5260	94 59
2860-2870	51 57	3660-3670	65 97	4460-4470	80 37	5260-5270	94 77
2870-2880	51 75	3670-3680	66 15	4470-4480	80 55	5270-5280	94 95
2880-2890	51 93	3680-3690	66 33	4480-4490	80 73	5280-5290	95 13
2890-2900	52 11	3690-3700	66 51	4490-4500	80 91	5290-5300	95 31
\$2900-2910	\$ 52 29	\$3700-3710	\$ 66 69	\$4500-4510	\$ 81 09	\$5300-5310	\$ 95 49
2910-2920	52 47	3710-3720	66 87	4510-4520	81 27	5310-5320	95 67
2920-2930	52 65	3720-3730	67 05	4520-4530	81 45	5320-5330	95 85
2930-2940	52 83	3730-3740	67 23	4530-4540	81 63	5330-5340	96 03
2940-2950	53 01	3740-3750	67 41	4540-4550	81 81	5340-5350	96 21
2950-2960	53 19	3750-3760	67 59	4550-4560	81 99	5350-5360	96 39
2960-2970	53 37	3760-3770	67 77	4560-4570	82 17	5360-5370	96 57
2970-2980	53 55	3770-3780	67 95	4570-4580	82 35	5370-5380	96 75
2980-2990	53 73	3780-3790	68 13	4580-4590	82 53	5380-5390	96 93
2990-3000	53 91	3790-3800	68 31	4590-4600	82 71	5390-5400	97 11
\$3000-3010	\$ 54 09	\$3800-3810	\$ 68 49	\$4600-4610	\$ 82 89	\$5400-5410	\$ 97 29
3010-3020	54 27	3810-3820	68 67	4610-4620	83 07	5410-5420	97 47
3020-3030	54 45	3820-3830	68 85	4620-4630	83 25	5420-5430	97 65
3030-3040	54 63	3830-3840	69 03	4630-4640	83 43	5430-5440	97 83
3040-3050	54 81	3840-3850	69 21	4640-4650	83 61	5440-5450	98 01
3050-3060	54 99	3850-3860	69 39	4650-4660	83 79	5450-5460	98 19
3060-3070	55 17	3860-3870	69 57	4660-4670	83 97	5460-5470	98 37
3070-3080	55 35	3870-3880	69 75	4670-4680	84 15	5470-5480	98 55
3080-3090	55 53	3880-3890	69 93	4680-4690	84 33	5480-5490	98 73
3090-3100	55 71	3890-3900	70 11	4690-4700	84 51	5490-5500	98 91
\$3100-3110	\$ 55 89	\$3900-3910	\$ 70 29	\$4700-4710	\$ 84 69	\$5500-5510	\$ 99 09
3110-3120	56 07	3910-3920	70 47	4710-4720	84 87	5510-5520	99 27
3120-3130	56 25	3920-3930	70 65	4720-4730	85 05	5520-5530	99 45
3130-3140	56 43	3930-3940	70 83	4730-4740	85 23	5530-5540	99 63
3140-3150	56 61	3940-3950	71 01	4740-4750	85 41	5540-5550	99 81
3150-3160	56 79	3950-3960	71 19	4750-4760	85 59	5550-5560	99 99
3160-3170	56 97	3960-3970	71 37	4760-4770	85 77	5560-5570	100 17
3170-3180	57 15	3970-3980	71 55	4770-4780	85 95	5570-5580	100 35
3180-3190	57 33	3980-3990	71 73	4780-4790	86 13	5580-5590	100 53
3190-3200	57 51	3990-4000	71 91	4790-4800	86 31	5590-5600	100 71
\$5600-5610	\$100 89	\$5700-5710	\$102 69	\$5800-5810	\$104 49	\$5900 and over	\$106 20
5610-5620	101 07	5710-5720	102 87	5810-5820	104 67		
5620-5630	101 25	5720-5730	103 05	5820-5830	104 85		
5630-5640	101 43	5730-5740	103 23	5830-5840	105 03		
5640-5650	101 61	5740-5750	103 41	5840-5850	105 21		
5650-5660	101 79	5750-5760	103 59	5850-5860	105 39		
5660-5670	101 97	5760-5770	103 77	5860-5870	105 57		
5670-5680	102 15	5770-5780	103 95	5870-5880	105 75		
5680-5690	102 33	5780-5790	104 13	5880-5890	105 93		
5690-5700	102 51	5790-5800	104 31	5890-5900	106 11		

TABLE X

Insurable Earnings	Employee's Required Premium		Insurable Earnings	Employee's Required Premium		Insurable Earnings	Employee's Required Premium	
	over	not over		over	not over		over	not over
	1.12%	1.4%		1.12%	1.4%		1.12%	1.4%
* 28—50	\$.44	\$.55	\$1500—1550	\$ 17.08	\$ 21.35	\$3000—3050	\$ 33.88	\$ 42.35
50—100	.84	1.05	1550—1600	17.64	22.05	3050—3100	34.44	43.05
100—150	1.40	1.75	1600—1650	18.20	22.75	3100—3150	35.00	43.75
150—200	1.96	2.45	1650—1700	18.76	23.45	3150—3200	35.56	44.45
200—250	2.52	3.15	1700—1750	19.32	24.15	3200—3250	36.12	45.15
250—300	3.08	3.85	1750—1800	19.88	24.85	3250—3300	36.68	45.85
300—350	3.64	4.55	1800—1850	20.44	25.55	3300—3350	37.24	46.55
350—400	4.20	5.25	1850—1900	21.00	26.25	3350—3400	37.80	47.25
400—450	4.76	5.95	1900—1950	21.56	26.95	3400—3450	38.36	47.95
450—500	5.32	6.65	1950—2000	22.12	27.65	3450—3500	38.92	48.65
\$ 500—550	\$ 5.88	\$ 7.35	\$2000—2050	\$ 22.68	\$ 28.35	\$3500—3550	\$ 39.48	\$ 49.35
550—600	6.44	8.05	2050—2100	23.24	29.05	3550—3600	40.04	50.05
600—650	7.00	8.75	2100—2150	23.80	29.75	3600—3650	40.60	50.75
650—700	7.56	9.45	2150—2200	24.36	30.45	3650—3700	41.16	51.45
700—750	8.12	10.15	2200—2250	24.92	31.15	3700—3750	41.72	52.15
750—800	8.68	10.85	2250—2300	25.48	31.85	3750—3800	42.28	52.85
800—850	9.24	11.55	2300—2350	26.04	32.55	3800—3850	42.84	53.55
850—900	9.80	12.25	2350—2400	26.60	33.25	3850—3900	43.40	54.25
900—950	10.36	12.95	2400—2450	27.16	33.95	3900—3950	43.96	54.95
950—1000	10.92	13.65	2450—2500	27.72	34.65	3950—4000	44.52	55.65
\$1000—1050	\$ 11.48	\$ 14.35	\$2500—2550	\$ 28.28	\$ 35.35	\$4000—4050	\$ 45.08	\$ 56.35
1050—1100	12.04	15.05	2550—2600	28.84	36.05	4050—4100	45.64	57.05
1100—1150	12.60	15.75	2600—2650	29.40	36.75	4100—4150	46.20	57.75
1150—1200	13.16	16.45	2650—2700	29.96	37.45	4150—4200	46.76	58.45
1200—1250	13.72	17.15	2700—2750	30.52	38.15	4200—4250	47.32	59.15
1250—1300	14.28	17.85	2750—2800	31.08	38.85	4250—4300	47.88	59.85
1300—1350	14.84	18.55	2800—2850	31.64	39.55	4300—4350	48.44	60.55
1350—1400	15.40	19.25	2850—2900	32.20	40.25	4350—4400	49.00	61.25
1400—1450	15.96	19.95	2900—2950	32.76	40.95	4400—4450	49.56	61.95
1450—1500	16.52	20.65	2950—3000	33.32	41.65	4450—4500	50.12	62.65

*Note: The minimum insurable earnings for each province is:

Newfoundland and Prince Edward Island—\$28.00	Nova Scotia—\$33.00
New Brunswick—\$30.00	Quebec, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and Territories—\$34.00

TABLE X, continued

Insurable Earnings	Employee's Required Premium		Insurable Earnings	Employee's Required Premium		Insurable Earnings	Employee's Required Premium	
	over	not over		over	not over		over	not over
	1.12%	1.4%		1.12%	1.4%		1.12%	1.4%
\$4500—4550	\$ 50.68	\$ 63.35	\$6000—6050	\$ 67.48	\$ 84.35	\$7500—7550	\$ 84.28	\$105.35
4550—4600	51.24	64.05	6050—6100	68.04	85.05	7550—7600	84.84	106.05
4600—4650	51.80	64.75	6100—6150	68.60	85.75	7600—7650	85.40	106.75
4650—4700	52.36	65.45	6150—6200	69.16	86.45	7650—7700	85.96	107.45
4700—4750	52.92	66.15	6200—6250	69.72	87.15	7700—7750	86.52	108.15
4750—4800	53.48	66.85	6250—6300	70.28	87.85	7750—7800	87.08	108.85
4800—4850	54.04	67.55	6300—6350	70.84	88.55	7800—7850	87.64	109.55
4850—4900	54.60	68.25	6350—6400	71.40	89.25	7850—7900	88.20	110.25
4900—4950	55.16	68.95	6400—6450	71.96	89.95	7900—7950	88.76	110.95
4950—5000	55.72	69.65	6450—6500	72.52	90.65	7950—8000	89.32	111.65
\$5000—5050	\$ 56.28	\$ 70.35	\$6500—6550	\$ 73.08	\$ 91.35	\$8000—8050	\$ 89.88	\$112.35
5050—5100	56.84	71.05	6550—6600	73.64	92.05	8050—8100	90.44	113.05
5100—5150	57.40	71.75	6600—6650	74.20	92.75	8100—8150	91.00	113.75
5150—5200	57.96	72.45	6650—6700	74.76	93.45	8150—8200	91.56	114.45
5200—5250	58.52	73.15	6700—6750	75.32	94.15	8200—8250	92.12	115.15
5250—5300	59.08	73.85	6750—6800	75.88	94.85	8250—8300	92.68	115.85
5300—5350	59.64	74.55	6800—6850	76.44	95.55	8300—8350	93.24	116.55
5350—5400	60.20	75.25	6850—6900	77.00	96.25	8350—8400	93.80	117.25
5400—5450	60.76	75.95	6900—6950	77.56	96.95	8400—8450	94.36	117.95
5450—5500	61.32	76.65	6950—7000	78.12	97.65	8450—8500	94.92	118.65
\$5500—5550	\$ 61.88	\$ 77.35	\$7000—7050	\$ 78.68	\$ 98.35	\$8500—8550	\$ 95.48	\$119.35
5550—5600	62.44	78.05	7050—7100	79.24	99.05	8550—8600	96.04	120.05
5600—5650	63.00	78.75	7100—7150	79.80	99.75	8600—8650	96.60	120.75
5650—5700	63.56	79.45	7150—7200	80.36	100.45	8650—8700	97.16	121.45
5700—5750	64.12	80.15	7200—7250	80.92	101.15	8700—8750	97.72	122.15
5750—5800	64.68	80.85	7250—7300	81.48	101.85	8750—8800	98.28	122.85
5800—5850	65.24	81.55	7300—7350	82.04	102.55	8800—8840	98.84	123.48
5850—5900	65.80	82.25	7350—7400	82.60	103.25	8840 and over	99.01	123.76
5900—5950	66.36	82.95	7400—7450	83.16	103.95			
5950—6000	66.92	83.65	7450—7500	83.72	104.65			

TABLE XI Income Tax Payments

Taxable Income:		Federal Tax Payable	Provincial Tax Payable	Taxable Income:		Federal Tax Payable	Provincial Tax Payable	Taxable Income:		Federal Tax Payable	Provincial Tax Payable
over	not over			over	not over			over	not over		
\$ 9300-	9310	\$1825	\$ 602.30	\$10000-	10010	\$2008	\$ 658.20	\$10700-	10710	\$2197	\$ 715.80
9310-	9320	1827	603.10	10010-	10020	2011	659.00	10710-	10720	2200	716.60
9320-	9330	1830	603.80	10020-	10030	2013	659.80	10720-	10730	2202	717.50
9330-	9340	1832	604.60	10030-	10040	2016	660.70	10730-	10740	2205	718.30
9340-	9350	1835	605.30	10040-	10050	2019	661.50	10740-	10750	2208	719.10
9350-	9360	1837	606.10	10050-	10060	2021	662.30	10750-	10760	2210	719.90
9360-	9370	1840	606.90	10060-	10070	2024	663.10	10760-	10770	2213	720.80
9370-	9380	1842	607.60	10070-	10080	2027	663.90	10770-	10780	2216	721.60
9380-	9390	1845	608.40	10080-	10090	2030	664.80	10780-	10790	2219	722.40
9390-	9400	1847	609.20	10090-	10100	2032	665.60	10790-	10800	2221	723.20
\$ 9400-	9410	\$1850	\$ 609.90	\$10100-	10110	\$2035	\$ 666.40	\$10800-	10810	\$2224	\$ 724.10
9410-	9420	1852	610.70	10110-	10120	2038	667.20	10810-	10820	2227	724.90
9420-	9430	1855	611.40	10120-	10130	2040	668.10	10820-	10830	2229	725.70
9430-	9440	1857	612.20	10130-	10140	2043	668.90	10830-	10840	2232	726.50
9440-	9450	1860	613.00	10140-	10150	2046	669.70	10840-	10850	2235	727.40
9450-	9460	1862	613.70	10150-	10160	2048	670.50	10850-	10860	2237	728.20
9460-	9470	1865	614.50	10160-	10170	2051	671.40	10860-	10870	2240	729.00
9470-	9480	1867	615.30	10170-	10180	2054	672.20	10870-	10880	2243	729.80
9480-	9490	1870	616.00	10180-	10190	2057	673.00	10880-	10890	2246	730.60
9490-	9500	1872	616.80	10190-	10200	2059	673.80	10890-	10900	2248	731.50
\$ 9500-	9510	\$1875	\$ 617.50	\$10200-	10210	\$2062	\$ 674.70	\$10900-	10910	\$2251	\$ 732.30
9510-	9520	1877	618.30	10210-	10220	2065	675.50	10910-	10920	2254	733.10
9520-	9530	1880	619.10	10220-	10230	2067	676.30	10920-	10930	2256	733.90
9530-	9540	1882	619.80	10230-	10240	2070	677.10	10930-	10940	2259	734.80
9540-	9550	1885	620.60	10240-	10250	2073	677.90	10940-	10950	2262	735.60
9550-	9560	1887	621.40	10250-	10260	2075	678.80	10950-	10960	2264	736.40
9560-	9570	1890	622.10	10260-	10270	2078	679.60	10960-	10970	2267	737.20
9570-	9580	1892	622.90	10270-	10280	2081	680.40	10970-	10980	2270	738.10
9580-	9590	1895	623.60	10280-	10290	2084	681.20	10980-	10990	2273	738.90
9590-	9600	1897	624.40	10290-	10300	2086	682.10	10990-	11000	2275	739.70
\$ 9600-	9610	\$1900	\$ 625.20	\$10300-	10310	\$2089	\$ 682.90	\$11000-	11010	\$2278	\$ 740.50
9610-	9620	1903	626.10	10310-	10320	2092	683.70	11010-	11020	2281	741.40
9620-	9630	1905	626.90	10320-	10330	2094	684.50	11020-	11030	2283	742.20
9630-	9640	1908	627.70	10330-	10340	2097	685.40	11030-	11040	2286	743.00
9640-	9650	1911	628.50	10340-	10350	2100	686.20	11040-	11050	2289	743.80
9650-	9660	1913	629.40	10350-	10360	2102	687.00	11050-	11060	2291	744.60
9660-	9670	1916	630.20	10360-	10370	2105	687.80	11060-	11070	2294	745.50
9670-	9680	1919	631.00	10370-	10380	2108	688.70	11070-	11080	2297	746.30
9680-	9690	1922	631.80	10380-	10390	2111	689.50	11080-	11090	2300	747.10
9690-	9700	1924	632.70	10390-	10400	2113	690.30	11090-	11100	2302	747.90
\$ 9700-	9710	\$1927	\$ 633.50	\$10400-	10410	\$2116	\$ 691.10	\$11100-	11110	\$2305	\$ 748.80
9710-	9720	1930	634.30	10410-	10420	2119	691.90	11110-	11120	2308	749.60
9720-	9730	1932	635.10	10420-	10430	2121	692.80	11120-	11130	2310	750.40
9730-	9740	1935	635.90	10430-	10440	2124	693.60	11130-	11140	2313	751.20
9740-	9750	1938	636.80	10440-	10450	2127	694.40	11140-	11150	2316	752.10
9750-	9760	1940	637.60	10450-	10460	2129	695.20	11150-	11160	2318	752.90
9760-	9770	1943	638.40	10460-	10470	2132	696.10	11160-	11170	2321	753.70
9770-	9780	1946	639.20	10470-	10480	2135	696.90	11170-	11180	2324	754.50
9780-	9790	1949	640.10	10480-	10490	2138	697.70	11180-	11190	2327	755.40
9790-	9800	1951	640.90	10490-	10500	2140	698.50	11190-	11200	2329	756.20
\$ 9800-	9810	\$1954	\$ 641.70	\$10500-	10510	\$2143	\$ 699.40	\$11200-	11210	\$2332	\$ 757.00
9810-	9820	1957	642.50	10510-	10520	2146	700.20	11210-	11220	2335	757.80
9820-	9830	1959	643.40	10520-	10530	2148	701.00	11220-	11230	2337	758.60
9830-	9840	1962	644.20	10530-	10540	2151	701.80	11230-	11240	2340	759.50
9840-	9850	1965	645.00	10540-	10550	2154	702.60	11240-	11250	2343	760.30
9850-	9860	1967	645.80	10550-	10560	2156	703.50	11250-	11260	2345	761.10
9860-	9870	1970	646.70	10560-	10570	2159	704.30	11260-	11270	2348	761.90
9870-	9880	1973	647.50	10570-	10580	2162	705.10	11270-	11280	2351	762.80
9880-	9890	1976	648.30	10580-	10590	2165	705.90	11280-	11290	2354	763.60
9890-	9900	1978	649.10	10590-	10600	2167	706.80	11290-	11300	2356	764.40
\$ 9900-	9910	\$1981	\$ 649.90	\$10600-	10610	\$2170	\$ 707.60	\$11300-	11310	\$2359	\$ 765.20
9910-	9920	1984	650.80	10610-	10620	2173	708.40	11310-	11320	2362	766.10
9920-	9930	1986	651.60	10620-	10630	2175	709.20	11320-	11330	2364	766.90
9930-	9940	1989	652.40	10630-	10640	2178	710.10	11330-	11340	2367	767.70
9940-	9950	1992	653.20	10640-	10650	2181	710.90	11340-	11350	2370	768.50
9950-	9960	1994	654.10	10650-	10660	2183	711.70	11350-	11360	2372	769.40
9960-	9970	1997	654.90	10660-	10670	2186	712.50	11360-	11370	2375	770.20
9970-	9980	2000	655.70	10670-	10680	2189	713.40	11370-	11380	2378	771.00
9980-	9990	2003	656.50	10680-	10690	2192	714.20	11380-	11390	2381	771.80
9990-	10000	2005	657.40	10690-	10700	2194	715.00	11390-	11400	2383	772.60

TABLE XI, continued

<i>Taxable Income:</i>	<i>over</i>	<i>not over</i>	<i>Federal Tax Payable</i>	<i>Provincial Tax Payable</i>	<i>Taxable Income:</i>	<i>over</i>	<i>not over</i>	<i>Federal Tax Payable</i>	<i>Provincial Tax Payable</i>	<i>Taxable Income:</i>	<i>over</i>	<i>not over</i>	<i>Federal Tax Payable</i>	<i>Provincial Tax Payable</i>
\$11400-11410			\$2386	\$ 773.50	\$12100-12110			\$2589	\$ 835.50	\$12800-12810			\$2806	\$ 901.70
11410-11420			2389	774.30	12110-12120			2593	836.50	12810-12820			2810	902.70
11420-11430			2391	775.10	12120-12130			2596	837.40	12820-12830			2813	903.60
11430-11440			2394	775.90	12130-12140			2599	838.40	12830-12840			2816	904.60
11440-11450			2397	776.80	12140-12150			2602	839.30	12840-12850			2819	905.50
11450-11460			2399	777.60	12150-12160			2605	840.30	12850-12860			2822	906.50
11460-11470			2402	778.40	12160-12170			2608	841.20	12860-12870			2825	907.40
11470-11480			2405	779.20	12170-12180			2611	842.20	12870-12880			2828	908.30
11480-11490			2408	780.10	12180-12190			2614	843.10	12880-12890			2831	909.30
11490-11500			2410	780.90	12190-12200			2617	844.10	12890-12900			2834	910.20
\$11500-11510			\$2413	\$ 781.70	\$12200-12210			\$2620	\$ 845.00	\$12900-12910			\$2837	\$ 911.20
11510-11520			2416	782.50	12210-12220			2624	845.90	12910-12920			2841	912.10
11520-11530			2418	783.40	12220-12230			2627	846.90	12920-12930			2844	913.10
11530-11540			2421	784.20	12230-12240			2630	847.80	12930-12940			2847	914.00
11540-11550			2424	785.00	12240-12250			2633	848.80	12940-12950			2850	915.00
11550-11560			2426	785.80	12250-12260			2636	849.70	12950-12960			2853	915.90
11560-11570			2429	786.60	12260-12270			2639	850.70	12960-12970			2856	916.90
11570-11580			2432	787.50	12270-12280			2642	851.60	12970-12980			2859	917.80
11580-11590			2435	788.30	12280-12290			2645	852.60	12980-12990			2862	918.70
11590-11600			2437	789.10	12290-12300			2648	853.50	12990-13000			2865	919.70
\$11600-11610			\$2440	\$ 789.90	\$12300-12310			\$2651	\$ 854.50	\$13000-13010			\$2868	\$ 920.60
11610-11620			2443	790.80	12310-12320			2655	855.40	13010-13020			2871	921.60
11620-11630			2445	791.60	12320-12330			2658	856.30	13020-13030			2873	922.50
11630-11640			2448	792.40	12330-12340			2661	857.30	13030-13040			2876	923.50
11640-11650			2451	793.20	12340-12350			2664	858.20	13040-13050			2879	924.40
11650-11660			2453	794.10	12350-12360			2667	859.20	13050-13060			2882	925.40
11660-11670			2456	794.90	12360-12370			2670	860.10	13060-13070			2885	926.30
11670-11680			2459	795.70	12370-12380			2673	861.10	13070-13080			2888	927.30
11680-11690			2462	796.50	12380-12390			2676	862.00	13080-13090			2891	928.20
11690-11700			2464	797.40	12390-12400			2679	863.00	13090-13100			2894	929.10
\$11700-11710			\$2467	\$ 798.20	\$12400-12410			\$2682	\$ 863.90	\$13100-13110			\$2897	\$ 930.10
11710-11720			2470	799.00	12410-12420			2686	864.90	13110-13120			2900	931.00
11720-11730			2472	799.80	12420-12430			2689	865.80	13120-13130			2903	932.00
11730-11740			2475	800.60	12430-12440			2692	866.70	13130-13140			2906	932.90
11740-11750			2478	801.50	12440-12450			2695	867.70	13140-13150			2909	933.90
11750-11760			2481	802.50	12450-12460			2698	868.60	13150-13160			2912	934.80
11760-11770			2484	803.40	12460-12470			2701	869.60	13160-13170			2915	935.80
11770-11780			2487	804.30	12470-12480			2704	870.50	13170-13180			2918	936.70
11780-11790			2490	805.30	12480-12490			2707	871.50	13180-13190			2921	937.70
11790-11800			2493	806.20	12490-12500			2710	872.40	13190-13200			2924	938.60
\$11800-11810			\$2496	\$ 807.20	\$12500-12510			\$2713	\$ 873.40	\$13200-13210			\$2926	\$ 939.50
11810-11820			2500	808.10	12510-12520			2717	874.30	13210-13220			2929	940.50
11820-11830			2503	809.10	12520-12530			2720	875.30	13220-13230			2932	941.40
11830-11840			2506	810.00	12530-12540			2723	876.20	13230-13240			2935	942.40
11840-11850			2509	811.00	12540-12550			2726	877.10	13240-13250			2938	943.30
11850-11860			2512	811.90	12550-12560			2729	878.10	13250-13260			2941	944.30
11860-11870			2515	812.90	12560-12570			2732	879.00	13260-13270			2944	945.20
11870-11880			2518	813.80	12570-12580			2735	880.00	13270-13280			2947	946.20
11880-11890			2521	814.70	12580-12590			2738	880.90	13280-13290			2950	947.10
11890-11900			2524	815.70	12590-12600			2741	881.90	13290-13300			2953	948.10
\$11900-11910			\$2527	\$ 816.60	\$12600-12610			\$2744	\$ 882.80	\$13300-13310			\$2956	\$ 949.00
11910-11920			2531	817.60	12610-12620			2748	883.80	13310-13320			2959	949.90
11920-11930			2534	818.50	12620-12630			2751	884.70	13320-13330			2962	950.90
11930-11940			2537	819.50	12630-12640			2754	885.70	13330-13340			2965	951.80
11940-11950			2540	820.40	12640-12650			2757	886.60	13340-13350			2968	952.80
11950-11960			2543	821.40	12650-12660			2760	887.50	13350-13360			2971	953.70
11960-11970			2546	822.30	12660-12670			2763	888.50	13360-13370			2974	954.70
11970-11980			2549	823.30	12670-12680			2766	889.40	13370-13380			2977	955.60
11980-11990			2552	824.20	12680-12690			2769	890.40	13380-13390			2979	956.60
11990-12000			2555	825.10	12690-12700			2772	891.30	13390-13400			2982	957.50
\$12000-12010			\$2558	\$ 826.10	\$12700-12710			\$2775	\$ 892.30	\$13400-13410			\$2985	\$ 958.50
12010-12020			2562	827.00	12710-12720			2779	893.20	13410-13420			2988	959.40
12020-12030			2565	828.00	12720-12730			2782	894.20	13420-13430			2991	960.40
12030-12040			2568	828.90	12730-12740			2785	895.10	13430-13440			2994	961.30
12040-12050			2571	829.90	12740-12750			2788	896.10	13440-13450			2997	962.20
12050-12060			2574	830.80	12750-12760			2791	897.00	13450-13460			3000	963.20
12060-12070			2577	831.80	12760-12770			2794	897.90	13460-13470			3003	964.10
12070-12080			2580	832.70	12770-12780			2797	898.90	13470-13480			3006	965.10
12080-12090			2583	833.70	12780-12790			2800	899.80	13480-13490			3009	966.00
12090-12100			2586	834.60	12790-12800			2803	900.80	13490-13500			3012	967.00

ACCOUNTANT. A person who records, summarizes, analyzes, and reports business and financial transactions.

ACCRUE. To accumulate, such as interest on a bond.

ACTUARY. A life insurance company employee who computes premium rates for policies.

ADJACENT. Next to or adjoining.

ADJUSTED GROSS INCOME. All income including salary, interest, and so on less adjustments to income, such as sick pay and moving expenses.

AGENT. A person or firm who buys or sells for the account of a principal.

AMORTIZATION. Extinguishing a debt with a series of equal annual (or monthly) payments.

AMORTIZATION SCHEDULE. A schedule showing the repayment of a debt by installments with a breakdown of each payment into interest and principal.

AMOUNT OF NOTE. The principal of a promissory note.

ANNUALLY. Once a year.

ANNUAL RATE. The rate of simple interest per year.

APPROVED MONTHLY BUDGET. An organized plan of expenditures and savings for the monthly income.

ARITHMETIC MEAN OR AVERAGE. The sum of a list of values divided by the number of values.

ARRAY. A grouping of statistical data according to rank order.

ARTICLES OF CO-PARTNERSHIP. An agreement in writing showing the duties and responsibilities of each partner in a partnership, also specifying how the profits and losses of the business will be shared.

ASK PRICE. The price a seller is willing to take for bonds or stocks.

ASSESSED VALUE. The value of the property for tax purposes; it is a fraction or percent of the market value.

ASSETS. Anything that a person or firm owns.

AUCTION. A sale where the items sold are awarded to the last and highest bidder in a series of competing bids.

AUDITOR. A person who verifies and test checks accounting records and statements.

AVERAGE. See *arithmetic mean*.

AVERAGE UNPAID BALANCE. The average of the starting cash unpaid balance and the ending cash unpaid balance.

AXIS. A horizontal or vertical line used for measurement or reference in a graphic presentation of data.

BALANCE. The difference between the sums of the debits and the credits in an account.

BANK CREDIT CARD. A card issued by a bank enabling the holder to make purchases on credit.

BANK DEBIT MEMO. A slip of paper to show service charges made by the bank for such services as maintaining a chequing account, printing cheques, overdrawing an account.

BANK DRAFT. A cheque drawn by a bank on its account in another bank.

BAR GRAPH. A graph showing data by means of bars from one axis to the appropriate value indicated by the other axis.

BASIC PREMIUM. An automobile insurance premium before any additions are made to reflect the specific class of risk insured.

BENEFICIARY. The recipient of the proceeds of a life insurance policy on the death of the insured.

BID PRICE. The price a buyer is willing to pay for bonds or stocks.

BOARD LOT. Usually 100 shares.

BODILY INJURY. Automobile liability insurance to cover the risk of personal injury caused by an automobile accident.

BOND (CORPORATION). A negotiable promise to pay a fixed sum of money at a future date (usually long term) with interest at a fixed rate.

BOND DISCOUNT. The difference between the face value of a bond and the price that it sells for.

BOND PREMIUM. The difference between the price that a bond sells for and the face value of the bond.

BOND QUOTATION. The price at which a bond will sell regardless of its face value.

BROKERAGE FIRM. A partnership or corporation dealing in securities either as principal or agent.

BUDGET. An organized plan of expenditures to coincide with the anticipated income for the period.

CANCELLATION DATE. The date an insurance policy is cancelled.

CANCELLED CHEQUE. A cheque that has been paid by the bank on which it is drawn.

CAPITAL INVESTMENT. The assets originally invested in a business less any liabilities.

CASH DISCOUNT. A discount to encourage prompt payment of an account.

CASH SELLING PRICE. The price of merchandise before any finance charge is added.

CASH UNPAID BALANCE. The cash selling price less the down payment of an installment contract.

CASH VALUE. The savings feature of a life insurance policy (except term insurance).

CENTRAL ANGLE. An angle of a circle having its vertex at the centre of the circle.

CERTIFIED CHEQUE. A cheque drawn on a bank and signed by an officer of the bank.

CHAIN DISCOUNT. A series of discounts to provide a larger margin of profit for larger quantity buyers.

CHARGE ACCOUNT. An account with a business firm whereby the purchaser can pay for his purchases at a later date or on an installment plan.

CHEQUEBOOK. A book of blank cheques with stubs (or memoranda sheets) to record the information on a cheque that is negotiated.

CHEQUING ACCOUNT. A commercial bank account in which withdrawals may be made with negotiable instruments known as cheques.

CHEQUES OUTSTANDING. Cheques entered in the chequebook, but not paid by the bank as of the date of the last bank statement.

CLAIM. A request for indemnity (reimbursement) for an insurance loss, or the report of a death of a person whose life was insured.

CLASS FREQUENCY. The number of values in a class interval.

CLASS INTERVAL. A unit of measurement in a frequency distribution to facilitate the presentation and computation of statistical data.

CLOSING BALANCE. The balance at the end of an

accounting period.

CLOSING INVENTORY. The cost of goods on hand at the end of an accounting period.

CLOSING PRICE. The price of a share of stock at the last trade of a given day.

CO-INSURANCE CLAUSE. A clause in an insurance policy that limits the liability of the insurance company when the property is under-insured.

COLLISION INSURANCE. Automobile insurance covering losses caused by impact.

COMMERCIAL ACCOUNT. A chequing account.

COMMISSION. A method of compensation: a salesman receives a percent of his sales as salary.

COMMISSION CHARGE. A fee charged by brokers for buying or selling stock for their customers.

COMPLEMENT. The difference between a number less than one and one, or the difference between a percent and 100%.

COMPOUND AMOUNT. The sum of the principal and the earned interest.

COMPOUND DISCOUNT. See *present value*.

COMPOUND INTEREST. Interest computed on the sum of the principal and earned interest.

COMPOUND PERIOD. A period of time at the end of which interest is paid on the compound amount.

COMPREHENSIVE INSURANCE. Automobile insurance covering any loss or damage to the vehicle other than by collision or upset.

CONCRETE. A mixture of sand, gravel, water, and cement (powdered lime and clay) used for building foundations, driveways, sidewalks, patios, walks, floors, and so on.

CONSECUTIVE. Following in order without interruption.

CONTRACTUAL RATE. A rate of interest specified in a legal agreement.

CONTRACTUAL VALUE. The maturity value of a bond.

CONTRACT UNPAID BALANCE. The sum of the installments for an installment payment contract. It is also the difference between the time selling price and down payment.

COST OF GOODS SOLD. The opening inventory plus the cost of goods purchased during the accounting period minus the closing inventory.

COST PRICE. The price a buyer pays for the merchandise that he purchases.

COVERAGE. An insurance term to designate a specific risk such as collision insurance.

CREDIT. The privilege of deferring the payment for goods and services purchased.

CREDIT CARD. A card issued by a financial institution enabling the holder to make purchases on credit.

CREDIT CARD STATEMENT. A monthly recapitulation of the charges, payments, and interest of a credit card account.

CREDIT RATING. The quality of a purchaser's reputation and ability to pay with reference to transactions on a credit basis.

CREDIT UNIONS. Organizations that act as clearing houses for members who want to borrow money and members who have money to loan.

CURRENT VALUE. The market value.

DATA. The measurements or values that are used in statistical presentations.

DEDUCTIBLE COLLISION INSURANCE. Automobile insurance that covers losses caused by collision or upset in excess of a minimum amount, usually \$100. The minimum amount is paid by the insured.

DEPENDENT PERSON. One who relies on someone else for his support.

DEPOSIT. A sum of money added to a bank account.

DEPOSITS IN TRANSIT. A deposit entered in the chequebook, but not included in the balance shown on the bank statement.

DIMENSIONS. The length and width of a surface or the length, width, and depth of a solid.

DIRECTLY PROPORTIONAL. Increases or decreases are in constant ratio.

DISABILITY INSURANCE. Insurance against the loss of earning ability for physical or mental reasons.

DISCOUNT DATE. The date on which a promissory note is discounted (bought by a bank).

DISCOUNT HOUSE. A business that professes to sell at lower prices, relying on a larger volume of sales to

make its net profit.

DISCOUNT INTEREST. Interest on a loan that is paid in advance (when the loan is taken out), instead of when the loan is due.

DISCOUNT PERIOD. The number of days from the date a promissory note is discounted to its maturity date.

DISCOUNT RATE. The rate of interest a bank charges to buy a promissory note.

DISPOSABLE INCOME. Income left over after all deductions are taken from a paycheck.

DIVIDEND. A distribution of the earnings of a corporation to its stockholders.

DOWN PAYMENT. The amount necessary to initiate an installment purchase plan.

EFFECTIVE RATE OF INTEREST. *See true interest rate.*

ENDOWMENT LIFE INSURANCE. A policy that is payable to the insured if he survives a given number of years, or is paid to the beneficiary upon the death of the insured.

EXACT OR ACCURATE YEAR. The 365-day year.

EXEMPTION. An income tax deduction for the taxpayer and each of his dependents as provided by the internal revenue laws.

EXPIRE. To lapse or die.

EXTENDED TERM INSURANCE. Term insurance purchased with the cash value of a life insurance policy.

FACE AMOUNT. The amount due and payable when a bond matures.

FACE VALUE. The contractual value of a bond as opposed to the market value.

FINANCE CHARGE. The fee charged for buying merchandise on the installment plan.

FIXED INCOME INVESTMENTS. Preferred stocks and bonds as opposed to common stocks.

FLAT RATE. The finance charge for an installment purchase, expressed as a percent of the cash unpaid balance.

FREQUENCY DISTRIBUTION. Organization of a list of data into groups to show how often each value occurs.

GRACE PERIOD. Amount of time allowed for monthly payment of a loan, from the time the payment is due until a late payment penalty is applicable (usually 10 or 15 days).

GRAPH. A visual presentation of statistical data.

GRAPH PAPER. Paper with horizontal and vertical rulings to facilitate the presentation of data graphically.

GROSS INCOME. Income before expenses are deducted.

GROSS PROFIT. The difference between retail price and cost price.

GROSS WAGES. Wages before deductions are made.

HIGH PRICE. The highest price per share paid for a stock on a given day.

HISTOGRAM. The graph of a frequency distribution.

HORIZONTAL SCALE. Values on the horizontal axis of a graph.

HOURLY WAGE. Rate of pay per hour.

INCOME TAXES. Federal and provincial taxes on the income of a person or firm as provided by the income tax laws.

INCOME TAX DEDUCTION. A reduction of the taxable income, allowed for certain kinds of expenditures and losses.

INDEPENDENT EVENT. Two events that occur at the same time. The favourable occurrence of one event does not depend on the other event.

INSTALLMENT CONTRACT. A contract of sale which is repaid in a series of equal payments, usually monthly.

INTEREST. The price paid for the use of money.

INTEREST-BEARING DAYS. The number of days used to compute interest on the principal amount.

INTEREST-BEARING NOTE. A promissory note that includes interest on the principal.

INTEREST RATE. The percent of the principal used to compute the cost of borrowing money.

INTERPOLATION. Insertion of missing values in a table.

INVESTMENT. Any commitment made by an investor with the expectation of a gain or a loss.

INVOICE. A written record of a purchase or sale of merchandise.

ISSUE. A security of a particular kind and date such as a bond issue to mature in the year 2000.

ITEMIZED DEDUCTIONS. Those income tax deductions as provided by law, which are listed in detail on the tax report.

LEAP YEAR. A year exactly divisible by four unless it ends in double zero (such as 1800, 1900, 2000), in which case it must also be exactly divisible by 400.

LENDING INSTITUTION. A financial organization, such as a bank, that loans money.

LIABILITY. An amount of money owed.

LIFE EXPECTANCY. The number of years that a person will live at his or her present age, based on an average for all persons living at that age.

LIMITED PAY LIFE INSURANCE. A policy that is paid-up after a specified number of annual premiums have been paid.

LIMIT OF LIABILITY. The maximum amount of money that an insurance company will pay to settle a claim covered by a certain risk.

LIMIT ORDER. An order to buy or sell stock at a specified price, or one that is better than the specified price.

LINE GRAPH. The visual presentation of statistical data by the use of straight or curved lines.

LISTED STOCK. A stock traded on an organized stock exchange.

LIST PRICE OR CATALOGUE PRICE. See *retail price*.

LOAN. An amount of money borrowed with or without interest.

LOW PRICE. The lowest price per share paid for a stock on a given day.

MARKET VALUE. The price that a security will bring if sold on that day.

MARK-UP, MARGIN, OR MARGIN OF PROFIT. The difference between the retail price of an item and its cost price.

MATURITY DATE. The date when a promissory note or a debt is due and payable.

MATURITY VALUE. The sum of the interest and the principal on a note.

MATURITY VALUE (BOND). The price at which a bond will be redeemed on the maturity date.

MEASURE OF CENTRAL TENDENCY. The mean (average), mode, or median of all the values in a set of statistical data.

MEDIAN. The middle value in a list of data arranged from smallest to largest

MIDPOINT. Average of the largest and smallest value.

MINIMUM BALANCE. A specified amount of money to be maintained in a bank chequing account to avoid the payment of a service charge.

MINIMUM PAYMENT. On a monthly bill for credit card expenses, the least amount that must be paid.

MODE. The value in a list of data that occurs most often.

MONTHLY. Once a month.

MONTHLY PAYMENT. The contract unpaid balance for an installment purchase divided by the number of monthly payments.

MORTALITY TABLE. A statistical table showing the number of people alive at each age from 1 to 99 years, the number of people that die at each age, and the death rate per 1000 for each age.

NET CHANGE. The difference between the price of a stock for the last trade of a given day and the price of the last trade the prior trading day.

NET COST. The difference between the sum of the premiums paid and the cash value of a policy at the end of a given period of years.

NET GAIN. The difference between the cash value and the sum of the premiums paid at the end of a given period of years.

NET PAY. Take-home pay: the gross wages minus all deductions.

NET PRICE. The amount paid for merchandise after subtracting discounts or allowances, if any.

NET PROFIT. The gross profit minus business (operating) expenses.

NOMINAL RATE OF INTEREST. The quoted rate of interest for a loan or for a bond. The nominal rate of interest for a bond is also known as the coupon rate.

NONFORFEITURE VALUE. The cash value of a life insurance policy after it has been in effect long enough to accrue a value. Note: Term insurance does not have cash value at any time.

NON-INTEREST-BEARING NOTE: A promissory note that does not include interest on the principal.

NOTE RECEIVABLE. See *promissory note*.

ODD LOT. Any number of shares of stock less than a board lot.

OPENING BALANCE. The balance carried forward from the prior period, which is the same as the closing balance of the prior period.

OPENING INVENTORY. The cost of goods on hand at the beginning of an accounting period.

OPENING PRICE. The price of a share of stock for the first trade of a given day.

OPERATING EXPENSES. The expenses of doing business such as salaries, rent, utilities, advertising, insurance, depreciation, and so on.

OPERATING STATEMENT. An accounting statement showing the receipts and disbursements of a business for a given period of time.

ORDINARY LIFE—WHOLE LIFE—STRAIGHT LIFE. Life insurance policies for which premiums are payable until death or age 99, at which time the policy matures as an endowment to the insured.

OVERDRAW (OR OVERDRAFT). To write cheques in excess of the balance of funds on deposit in the account.

OVER-INSURED. Property insured for more than its value.

OVERTIME. Time worked in excess of the normal week, usually 40 hours per week.

PAID CHEQUE. A cheque that has been paid by the bank on which it is drawn.

PAID-UP POLICY. A life insurance policy that requires no further payments of premiums.

PANELING. Building material used to cover the interior walls of a structure.

PARTNERSHIP. A form of business organization for two or more persons.

PAR VALUE. The initial value placed upon securities when they are issued.

PAYCHEQUE. The net earnings of an employee after deductions have been made.

PAYROLL DEDUCTIONS. Anything taken out of an employee's paycheque to pay income tax withholding, social security, unemployment or disability insurance, union dues, charitable contributions, and so on.

PER M. Per thousand.

PERSONAL LOAN. A loan to an individual, which is secured by his wages, his home, his furniture, or some other asset.

PHYSICAL DAMAGE. Any damage to an automobile; or the theft of the vehicle or any part of it.

PIECE-RATE WAGE. Rate of pay based on the quantity of work produced.

PIE CHART. A circular graph showing data as percents of a whole (the circle).

POINTS. Points are used to quote bond prices. Each point is one percent.

PREFERRED STOCK. Stock in a corporation having a prior claim over common stock in receiving dividends and claiming assets.

PREMIUM. The price paid for insurance protection.

PRE-PAYMENT PENALTY. Fee charged for paying off a loan in full before it is due, instead of paying the scheduled monthly installments.

PRESENT VALUE. The discounted value at compound interest of an amount due at a future date.

PRICE/EARNINGS RATIO. The ratio of the price per share of stock to the earnings (of the company) per share of stock.

PRINCIPAL. A person or firm who buys or sells for his own account and not as an agent for someone else.

PRINCIPAL. Amount of money on which interest is computed.

PRIOR BALANCE. The closing balance for the prior period, which becomes the opening balance for the

next period.

PROBABILITY. Ratio of the number of favourable occurrences of an event to the total number of possible occurrences.

PROCEEDS. The amount payable in a financial transaction.

PROCEEDS OF A NOTE. The difference between the maturity value of a promissory note and the discount interest.

PROGRESSIVE TAX. A tax system such that people with higher incomes are taxed at a higher rate than people with lower incomes.

PROMISSORY NOTE. A written promise to pay a certain amount of money at a specified future date with or without interest.

PROPERTY DAMAGE. Damage to real or personal property as opposed to bodily injury or death of persons.

PROPERTY TAX. A tax paid by property owners, based on the value of their property.

PROPORTION. Equivalency of two ratios.

PRO-RATE. To divide into proportional parts.

PURCHASES. In an operating statement, the merchandise that is added to the opening inventory to obtain the amount of goods available for sale.

QUARTERLY. Four times a year (every three months).

RADIUS. Any straight line extending from the centre of a circle to its circumference.

RANGE. The difference between the highest and lowest prices of a stock for a given period of time.

RATING FACTORS. The elements that effect an insurance risk from the underwriting standpoint, such as for automobile insurance—who drives the vehicle, in what territory, for what purposes, and so on.

RATIO. The quotient of two numbers, usually written as a fraction.

REAL PROPERTY. Land and any buildings on the land.

RECONCILE. To account for the differences in balances of a chequing account as shown by the bank statement and by the depositor's chequebook.

REGULAR TIME. Rate of pay per hour for the normal work week of 40 hours or less.

RETAIL PRICE. The price which the consumer is expected to pay for merchandise. It is also known as the list price or the catalogue price.

REVOLVING CHARGE ACCOUNT. A charge account that is open-ended so that the customer can continue buying without paying the balance in full when the bill is presented.

RUBBER-BASE PAINT. A synthetic paint which is water soluble.

SAFE DEPOSIT BOX. Small metal box kept in a bank vault and rented by the bank for storage of valuable or irreplaceable items.

SALARY. An employee's compensation, usually paid on a weekly or monthly basis.

SALES DISCOUNTS OR MARKDOWNS. Percent reductions or dollar reductions of the original selling price of merchandise.

SALES QUOTA. The amount of business expected of a salesman during a given period of time.

SALES TAX. A tax imposed on retail sales and paid by the consumer.

SAVINGS. Any part of disposable income that is not spent immediately.

SAVINGS ACCOUNT. Money deposited with a financial institution to earn compound interest.

SECURITIES. Shares of common or preferred stocks, or bonds purchased or sold for investment purposes.

SELF-EMPLOYED. A person who works under his own supervision, supplies his own tools or equipment as needed, and contracts with his customers; as opposed to a person who is employed and paid by another person.

SELLING PRICE. The cost price of an item plus the mark-up.

SEMI-ANNUALLY. Twice a year (every six months).

SEMI-SKILLED WORKER. An employed person whose job requires less skill and technical training than that for a skilled worker, but more than that for an unskilled worker.

SERVICE CHARGE. A fee charged by a bank for maintaining a chequing account.

SHARE OF STOCK. One unit of ownership in a corporation.

SIMPLE INTEREST. The amount of interest obtained by multiplying the principal times the rate of interest times the period (expressed in years).

SIMPLE INTEREST RATE. The annual rate of interest on the principal only, without compounding.

SINGLE DISCOUNT EQUIVALENT. One discount that is equivalent to a given chain discount.

SKILLED WORKER. An employed person whose job requires specialized or technical training.

STANDARD DEDUCTION. A fixed amount or percent of income as provided by law, which may be taken as a general deduction from gross income.

STOCK EXCHANGE. A market place where member buyers and sellers of securities can meet to do business.

STOCKHOLDER. A person who owns one or more shares of stock in a corporation.

STOCK QUOTATION. The market price at which a stock is traded at that particular time.

STRAIGHT COMMISSION. Method of payment for salesmen who are paid a percent of the amount sold.

STRAIGHT TIME. See *regular time*.

SUBTOTAL. Part of a grand total.

TAXABLE INCOME. Gross income less deductions and allowance for exemptions.

TERM LIFE INSURANCE. A policy written for a specified number of years after which time the insurance expires if the insured is still living.

TIME-AND-ONE-HALF. Rate of pay for overtime is one and one-half times the straight time rate.

TIME SELLING PRICE. The cash selling price of merchandise plus the finance charge, or the down payment plus the sum of the installment payments.

TRADE DISCOUNT. A deduction from retail selling price offered by wholesalers to retailers.

TRADE-IN ALLOWANCE. The credit received on a purchase when merchandise is traded or turned-in.

TRANSACTION. A purchase and a sale, which constitutes a trade.

TRAVELLERS CHEQUES. Cheques purchased from a financial institution, which are spent or cashed at a later time by counter-signing them in the presence of the payee.

TRUE DISCOUNT. See *present value*.

TRUE INTEREST RATE. The actual rate of interest on a loan or a bond, computed by dividing the interest (expressed in dollars) by the principal. For a bond, the interest would be divided by the price paid for the bond.

UNDER-INSURED. Property insured for less than its value.

UNDERWRITING FACTORS. Factors which determine the cost of an automobile insurance policy, such as where the car is kept, how it is used, who drives the car, the value of the car, and so on.

UNEARNED PREMIUM. That portion of the total premium, which is returned to the insured when a policy is cancelled before the expiration date.

UNEMPLOYMENT INSURANCE. An insurance plan to provide payments for qualified unemployed workers.

UNION DUES. Monthly dues required for membership in a labour union.

UNLISTED STOCK. A stock traded on other than an organized stock exchange.

VANDALISM. Damage caused by malicious mischief.

VERTICAL SCALE. Values on the vertical axis of a graph.

VOID (LAW). Without legal effect.

WHOLESALE PRICE. The price that the retailer pays when he buys merchandise for re-sale.

WITHDRAWAL. The removal of all or a part of the funds on deposit in a bank account.

WITHHOLDING TAX. Amount deducted from a pay-check to pre-pay income taxes.

YIELD. The ratio of the income per year to the amount invested, usually expressed in percent.

ANSWERS

Page 2

1. Sixty-two 2. Five hundred sixty-seven 3. Six thousand nine hundred thirty-two 4. Seven thousand nine hundred four 5. Forty-six thousand one hundred seventy 6. Five hundred thirty-one thousand thirty-nine 7. Eight million three hundred two thousand seven hundred eighty-two. 8. Eighteen million four hundred fifty-eight thousand nine hundred fifteen 9. Three hundred ninety million three hundred eighty-nine thousand seven hundred fifty-five 10. Two billion one hundred eighty-two million seven hundred eighty-two thousand four hundred fifty-six. 11. Seven billion four hundred forty-one million three hundred ninety-six thousand seventy 12. Eight billion one hundred fifty-six million nine hundred twenty-four thousand five hundred thirty-eight 13. 97 14. 522 15. 6441 16. 48 142 17. 978 608 18. 9 200 935 19. 92 750 720 20. 133 948 717

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1. 1 000 000; 600 000 2. 1 000 000; 500 000 3. 1 000 000; 800 000 4. 8 000 000; 7 700 000 5. ---; 100 000 6. 6 000 000; 6 000 000 7. 1 000 000; 900 000 8. ---; --- 9. ---; --- 10. 22 000 000; 21 600 000

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9. 31 500	10. 213 800	11. 6800	12. 87 500
29 700	800	500	174 600
9000	32 200	18 100	500
4200	4800	2700	3200
400	100	600	100
74 800	251 700	28 700	265 900

223, 167, 166, 556; 123, 177, 160, 96, 556

Pages 8 and 9 (Word Problems)

1. 44, 43, 87, 36, 36; 72 2. 5904 3. 1923 4. 18, 28, 5, 51 5. 102, 115, 51, 140; 122, 141, 50, 41, 140 6. 2437, 21

Page 9 (Check Your Progress)

1. Seventy-seven million two hundred ninety-two thousand two hundred thirty-one 2. Eighty-one thousand six hundred fifty-four 3. Six hundred twelve million five hundred twenty-one thousand seven 4. Two million eight hundred sixty thousand twenty-three 5. 5020 6. 4 591 737 7. 10 000 000 8. 1 000 000 9. 3 000 000 10. 3 000 000 11. 27 978 12. 17 117 13. 19 430 14. 13 256 15. 21 337 16. 117 17. 179 18. 155 19. 1473 20. 1716

Page 12

1. 1 2. 4 3. 6 4. 0 5. 3 6. 9 7. 5 8. 3 9. 7 10. 10 11. 5 12. 5 13. 9 14. 6 15. 7 16. 9 17. 9 18. 6

Page 13

1. 339 2. 243 3. 1911 4. 5292 5. 3879 6. 169 7. 1108 8. 1875 9. 88 055 10. 51 089

Page 14

1. 57 2. 79 3. 287 4. 246 5. 155 6. 312 7. 7063 8. 1421 9. 19 759 10. 42 577

Page 15

1. 558, 191, 380, 238, 362, 270 2. 261, 200, 235, 193, 272, 185; 63, 111, 113, 57, 67, 57

Page 16 (Mixed Problems)

1. 4, 4 2. 12, 12 3. 6, 6 4. 6, 6 5. 6, 6 6. 4, 4 7. 60, 40, 4000, 1, 4121 8. 4000, 3, 600, 14 000, 110, 600, 60 000, 6000, 70, 66 274 9. 9273 10. 9091 11. 56 057 12. 17 824 13. 143 949 14. 183, 159, 181, 166, 344, 88, 86

Pages 16 and 17 (Word Problems)

1. 292, 417, 18 2. 94 403 3. 1469, 6335 4. 155 5. 63 6. less 1264 7. 157 8. Stone 80 146

Page 17 (Check Your Progress)

1. 5 2. 3 3. 6 4. 4 5. 6 6. 4662 7. 8208 8. 97
9. 775 10. 4963 11. 2501 12. 72 630 13.
18 891 14. 6591 15. 9056 16. 76, 16, 25, 68,
59

Page 20

1. 54 2. 28 3. 24 4. 56 5. 12 6. 25 7. 63 8.
18 9. 81 10. 24 11. 66 12. 48 13. 96 14. 121
15. 84

Page 21

1. 1036 2. 3726 3. 8866 4. 28 073 5. 55 269
6. 305 164 7. 176 550 8. 26 680 9. 36 540
10. 187 272 11. 188 512 12. 155 530
28. 36 29. 72 30. 144 31. 180 32. 212 33. 250
34. 298 35. 1188

Page 22

1. 194 233 2. 731 3. 197 650 4. 7176 5. 54 990
6. 16 884

Page 23

1. 4731 2. 2576 3. 216 225 4. 85 952 5. 653
184 6. 14 381 510

Page 24 (Mixed Problems)

1. 42 2. 32 3. 22 4. 45 5. 27 6. 60 7. 3, 60, 1, 2,
8; 48, 48, 144, 2880, 3024 8. 4, 30, 0, 6, 7, 0;
225 225, 900, 6750, 7650 9. 3000 10. 7200
11. 4000 12. 21 000 13. 2928 14. 7144 15. 36
582 16. 18 396 17. 72 314 18. 123 255 19. 261
950 20. 380 871

Pages 24 and 25 (Word Problems)

1. 7 2. 15 600 sq. metres 3. 15 860 kilograms;
15 840 kilograms; No 4. (a) 154 litres; 616 litres
(b) 770 km; 3080 km 5. 1392; 1584; 4248; 7036
3192; 12 960; 18 408; 4340 6. (a) 3360 (b) 20
160

Page 25 (Check Your Progress)

1. 121 2. 56 3. 24 4. 36 5. 30 6. 2916 7. 3010
8. 6566 9. 3636 10. 34 680 11. 69 696 12. 310
310 13. 292 293 14. 255 136 15. 390 165 16.
3135 17. 36 068 18. 308 516 19. 459 5 328 20.
16 253 514

Page 28

1. 9; 9 2. 12; 12 3. 2; 2 4. 3; 3 5. 8; 8 6. 11; 11
7. 8; 8 8. 7; 7 9. 7; 7 10. 11; 11

Page 29

1. 28 2. 21 3. 39 4. 71 5. 25 6. 19 7. 53 8. 87
9. 79 10. 82 11. 66 12. 51 13. 19 14. 32 15. 199
16. 525 17. 137 18. 683 19. 244 20. 457 21. 3
22. 4 23. 9 24. 3 25. 2 26. 5 27. 6 28. 8

Page 30

1. 544; 54.4 2. 231; 23.1 3. 513; 51.3 4. 621;
62.1 5. 621.8; 62.18 6. 970; 97 7. 651.9; 65.19
8. 877.2; 87.72 9. 102.6; 10.26 10. 550.3; 55.03
11. 839.9; 83.99 12. 1772.4; 177.24 13. 8651.5;
865.15 14. 4491.2; 449.12 15. 3396.9; 339.69
16. 18 17. 34 18. 96 19. 17 20. 55 21. 171 22.
210 23. 300 24. 3726 25. 11 047 26. 16 27. 28

Page 31

1. 23 2. 61 3. 44 4. 14 5. 62 R40 6. 46 7. 72 8.
525 9. 143 10. 48 11. 241 12. 661

Page 32 (Mixed Problems)

1. 9 2. 12 3. 227 4. 6 R0 5. 4 R91 6. 30 7. 162
8. 478.36 9. 196.4 10. 73 11. 30 368 12. 93
13. 123 14. 53 15. 96 16. 49 17. 197 18. 210
19. 651 20. 651; Yes

Pages 32 and 33 (Word Problems)

1. (a) 200 km	(b) 4.4 km	(c) 8.33	2. 126, 18
3 3.	800 g	133 g	
Monday	1500	900	
Tuesday	2125	1275	
Wednesday	2315	1389	
Thursday	1695	1017	
Friday	2090	1254	
	9725	5835	

4. 405 5. 16 704; 1392 6. 25 kg; 356 crates;
12 trucks

Page 33 (Check Your Progress)

1. 9, 9 2. 7, 7 3. 12, 12 4. 99 5. 11 6. 135 7. 5
8. 6 9. 7 10. 493.62 11. 539 12. 96 13. 1539
14. 324 15. 15 784 16. 78 17. 164 18. 144 19.
330 20. 183

Page 36

1. P 2. M 3. I 4. M 5. P 6. I 7. P 8. I 9. M 10. I
11. M 12. P 13. M 14. P 15. P 16. P 17. I 18. M
19. I 20. P 21. M 22. M 23. I 24. P

Page 37

1. 1-1/5 2. 1-1/7 3. 1-2/3 4. 4-2/4 or 4-1/2
5. 4-1/6 6. 3-6/9 or 3-2/3 7. 1-22/23 8. 3-11/13
9. 5-5/12 10. 4-14/15 11. 4-2/21 12. 8-4/11 13.
5-10/21 14. 18 15. 11-7/12 16. 21/8 17. 20/3
18. 15/2 19. 41/8 20. 66/7 21. 97/9 22. 25/2
23. 44/3 24. 78/5 25. 73/4 26. 96/5 27. 133/6
28. 125/8 29. 91/2 30. 2801/45

Page 38

1. 1/8 2. 1/2 3. 3/5 4. 1/10 5. 1/8 6. 1/5 7. 3/7
8. 5/7 9. 3/5 10. 1/2 11. 4/5 12. 3/4 13. 2/3 14.
5/6 15. 2/3

Page 39

1. 6; 4/6, 5/6 2. 12; 4/12, 7/12 3. 24; 15/24, 4/24 4. 48; 20/48, 9/48 5. 42; 30/42, 7/24 6. 180; 28/180, 27/180 7. 12; 6/12, 8/12, 9/12 8. 18; 12/18, 3/18, 10/18 9. 48; 20/48, 9/48, 42/48

Page 40

1. 1-1/4 2. 1-2/7 3. 1-1/5 4. 1-1/11 5. 1-1/2 6. 13/17 7. 1 8. 1 9. 19/24 10. 5/9 11. 11/21 12. 3/4 13. 1-1/12 14. 13/24 15. 19/64 16. 92/105

Page 41

1. 2/9 2. 2/3 3. 3/13 4. 2/5 5. 2/9 6. 5/19 7. 7/25 8. 6/25 9. 1/8 10. 1/20 11. 3/40 12. 5/84 13. 5/56 14. 49/132 15. 25/126 16. 37/208

Page 42

1. 1/5 2. 7/9 3. 10/21 4. 9/40 5. 1/6 6. 5/18 7. 5/18 7. 1/8 8. 2/33 9. 21/52 10. 8/105 11. 5/48 12. 7/110 13. 26/75 14. 45/448 15. 77/2500 16. 9/935 17. 35/36 18. 7-3/7 19. 6-1/4 20. 3-37/45 21. 8-10/21 22. 13-9/16 23. 17-11/14 24. 87-1/2 25. 185-12/55 26. 363-5/6 27. 140-31/70 28. 7-1/3

Page 43

1. 1/8 2. 7/40 3. 6 4. 12 5. 1-1/20 6. 1-7/8 7. 3-1/9 8. 5/24 9. 1-3/4 10. 13/15 11. 2-2/5 12. 2-2/11 13. 2 14. 1-7/20 15. 4/5 16. 609/704

Page 44 (Mixed Problems)

1. 12; 4/12, 3/12, 10/12 2. 24; 15/24, 14/24, 4/24 3. 36; 8/36, 9/36, 10/36 4. 16; 12/16, 14/16, 15/16 5. 3-17/30 6. 120/197 7. 25/128 8. 1-1/18 9. 1-19/168 10. 25/32 11. 49/72 12. 4-2/3 13. 11-19/55 14. 307-1/8 15. 5-1/63 16. 1/20 17. 6 18. 4-31/56 19. 7-7/18 20. 3-9/10

Pages 44 and 45 (Word Problems)

1. (a) 393-1/2 km (b) 78-7/101 (c) 7-87/100
2. (a) 196-1/2 cm (b) 11-79/100m (c) 23-29/50m
3. (a) Ned: 24-5/12; Hank: 12-7/12; Stephanie: 30-3/4; Eloise: 40-2/3; Will: 43-5/6; Paul 14-7/12; Carla: 28-5/12 (b) Eloise: 2/3 hr. more; Will: 3-5/6 hr. more 4. 7-2/5 metres; 3-9/50 metres
5. (a) 125; 65; 1/2; 1; 1/2; 7-1/2; 2-1/2; 7-1/2; 2-1/2; 1-1/4; 1-1/4; 1/2; 1/8 (b) 750; 390; 3; 6; 45; 15; 45; 15; 7-1/2; 7-1/2; 3; 3/4

Page 45 (Check Your Progress)

1. M 2. I 3. I 4. P 5. 6-2/11 6. 23/6 7. 29/3 8. 4-3/8 9. 19/7 10. 55/60, 32/60, 9/60 11. 12/16, 5/16, 14/16 12. 28/36, 9/36, 33/36 13. 1-11/48 14. 35/88 15. 3-7/10 16. 4-17/42 17. 2/3 18.

67-95/96 19. 6 20. 2-11/12

Page 48

1. 0.6 2. 0.4 3. 0.04 4. 6.03 5. 1.3 6. 29.72
7. 0.002 8. 11.209 9. 29.0025 10. 242.9876
11. 0.5 12. 309 13. 0.009 14. 2.015 15. 0.0098
16. 867 17. 0.03 18. 16.38 19. 0.008
20. 0.456

Page 49

1. 28.30 2. 36.85 3. 42.28 4. 53.42 5. 51.868
6. 108.024 7. 10.830 8. 252.652 9. 1024.60686
10. 717.54779 11. 0.3 12. 0.4 13. 0.08
14. 1.72 15. 0.27 16. 2.78 17. 5.803 18. 7.302

Page 50

1. 0.24 2. 0.36 3. 0.3115 4. 0.1848 5. 0.0024
6. 0.0027 7. 0.0306 8. 0.0344 9. 0.07749
10. 0.11868 11. 0.00392 12. 0.03240 13.
4.284 14. 27.436 15. 281.20 16. 332.64
17. 8.50408 18. 159.7386 19. 854.1405 20.
1573.5720 21. 33.35364 22. 68.83968 23.
315.16212 24. 1261.97841

Page 51

1. 8.2 2. 72 3. 42 4. 9.1 5. 12.12 6. 70.4 7.
27.32 8. 25 9. 24.24 10. 5.98 11. 16.28 12.
21.264

Page 52

1. 3/5 2. 1/25 3. 18/25 4. 12/25 5. 1/250 6.
1/125 7. 1/40 8. 1/8 9. 7/8 10. 269/500 11.
0.25 12. 0.2 13. 0.125 14. 0.1 15. 0.025 16.
0.02 17. 0.375 18. 0.6 19. 0.7 20. 0.32

Page 53

1. 0.7 2. 0.83 3. 0.31 4. 0.478 5. 0.3906 6.
0.15290 7. 0.228; 0.129; 0.600; 0.076; 0.218;
0.143; 1.3943, 1.394 8. 0.531; 0.978; 0.307;
0.816; 0.345; 0.454; 3.4305, 3.431 9. 0.273;
0.220; 0.954; 0.607; 0.713; 0.414; 3.1807;
3.181 10. 0.036; 0.287; 0.603; 0.186; 0.544;
0.455; 2.1107, 2.111

Page 54 (Mixed Problems)

1. 49.39 2. 57.404 3. 166.083 4. 922.639 5.
0.375 6. 0.5625 7. 0.1 8. 0.475 9. 26.95 10.
46.1 11. 35.4 12. 0.00504 13. 0.0896 14. 0.8
15. 41.2 16. 1.78044 17. 0.216; 0.505; 0.938;
0.230; 0.297; 0.702; 2.8977, 2.898 18. 0.865;
0.797; 0.455; 0.432; 0.307; 0.803; 3.6587,
3.659 19. 0.584; 0.722; 0.510; 0.844; 0.212;
0.607; 3.47856, 3.479 20. 0.370; 0.480; 0.402;
0.529; 0.947; 0.164; 2.890944, 2.892

Pages 54 and 55 (Word Problems)

1. (a) \$219 009.36 (b) \$74 395.44 (c) \$144 613.92 2. (a) \$374.88 (b) \$301.70 (c) \$793.86 3. \$1.85; \$0.73; \$2.20; \$0.98; \$0.77; \$9.20 4. \$116.55; \$246.79; \$184.52; \$386.10; \$149.70; \$114.00; \$1197.66

Page 55 (Check Your Progress)

1. 70.9201 2. 258.5715 3. 0.7575 4. 5.92 5. 11.5985 6. 0.31 7. 1.536 8. 0.097 9. 0.2051 10. 16.308 11. 49.66803 12. 0.8 13. 16/25 14. 0.467 15. 103/125 16. 5/8 17. 0.5 18. 0.082 19. 0.61 20. 0.3057

Page 58

1. 1/10 2. 7/20 3. 17/25 4. 3/100 5. 4/125 6. 1/400 7. 3/400 8. 103/2000 9. 73/500 10. 197/500 11. 181/200 12. 3/500 13. 3/10000 14. 1/5000 15. 3/800 16. 0.15 17. 0.32 18. 0.07 19. 0.09 20. 0.28 21. 0.57 22. 0.82 23. 0.95 24. 0.344 25. 0.296 26. 0.523 27. 0.815 28. 0.2776 29. 0.4215 30. 0.6837

Page 59

1. 50% 2. 75% 3. 90% 4. 70% 5. 15% 6. 66.7% 7. 25.5% 8. 27% 9. 24% 10. 12.5% 11. 33% 12. 47% 13. 54% 14. 6% 15. 175% 16. 202% 17. 47.3% 18. 52.6% 19. 62.5% 20. 70.09%

Page 60

1. 15 2. 10 3. 8 4. 16 5. 7 6. 4 7. 10 8. 39 9. 26 10. 32 11. 3 12. 4 13. 3 14. 12 15. 25

Page 61

1. 33.3% 2. 44.4% 3. 30% 4. 18.18% 5. 45.45% 6. 46.15% 7. 8.19% 8. 9.27% 9. 41.9% 10. 52.7% 11. 4.33% 12. 29.5%

Page 62

1. 8.91 2. 29.12 3. 300 4. 360.96 5. 147.18 6. 910 7. 1.944 8. 3.304 9. 0.385 10. 0.288 11. 5.418 12. 2.34

Page 63

1. 195 2. 825 3. 275 4. 542.42 5. 2.6 6. 28 7. 326 8. 176 9. 14 10. 800

Page 64 (Mixed Problems)

1. 5, 20 2. 25.3, 4, 12, 12% 3. 87.5, 875, 8 4. 0.005, 0.05, 0.00005 5. 326, 326% 6. 12.5, 125, 0.125 7. 6 8. 56 9. 13 10. 190 11. 16.4% 12. 363.58 13. 375 14. 534.6 15. 1.778 16. 0.6% 17. 29.3% 18. 43 19. 28.35 20. 438

Pages 64 and 65 (Word Problems)

1. Blouses: \$4.17 each; Swimsuit: \$11.75; Shirts: \$6.00 each; Total: \$36.26 2. Extension: \$1534.02; \$1907.75; \$1462.88; \$1555.02; \$582.12; \$1302.50; Total: \$1073.81, \$1430.81, \$1045.96, \$933.01, \$454.05, \$781.50 3. First: 28 litres; Second: 21 litres; Third: 37-1/3 litres 4. Food: \$1935.80; Clothing: \$925.82; Rent: \$1178.82; Household Operation: \$1094.15; Medical: \$589.16; Transportation: \$841.65; Recreation: \$504.99; Savings: \$1346.64 5. 4.9%; 7.4%; 5.6%; 10.2%, 3.1%; 10% 6. \$40 294.12; \$42 352.94; \$34 852.94; \$38 135.29; \$36 929.41; \$34 382.35

Page 65 (Check Your Progress)

1. 0.333 2. 1/5, 0.2 3. 2/5, 0.4 4. 13/20, 0.65 5. 60% 6. 83-1/3% 7. 71.5% 8. 37.5% 9. 56 10. 12 11. 8 12. 10.8% 13. 0.8% 14. 187.6% 15. 1.776 16. 38.52 17. 207.025 18. 2790 19. 12 20. 200

Page 69

1. 33.59 = 34 2. 46.363 3. \$0.87 4. 11.375 = 11.4 5. 43.6 = 44 6. 78.69 = 79

Page 71

1. 13 2. 25 3. 90 4. 40 5. 12 6. 88 7. 21, 25; Yes; Yes 8. \$0.86, \$0.87, \$0.88; No 9. 44; Yes

Page 73

1. \$20 500.00 2. 35 3. 613 4. \$0.57 5. 4 6. 5

Page 75

1. \$412.40 2. \$77.12 3. \$1855.76 4. \$522.17

Page 77

1. 1/2 2. 1/13 3. 1/4 4. 1/2 5. 3/13 6. 3/26

Page 78

1. 1/2 2. 51/52 3. 12/13 4. 5/6 5. 2/3 6. 1/2

Page 79

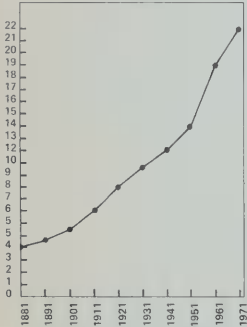
1. 1/8 2. 1/4 3. 1/36 4. 1/4 5. 1/8 6. 1/216

Page 80 (Problems)

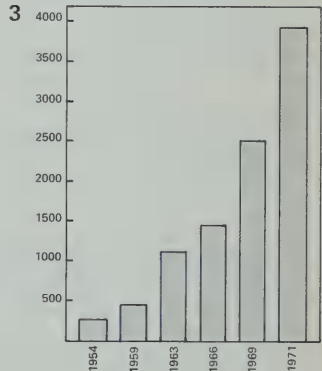
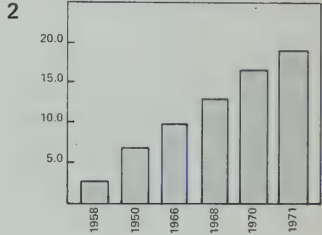
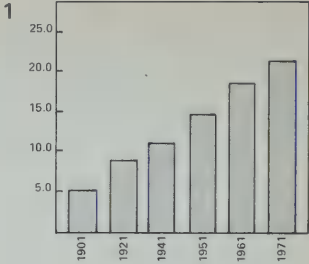
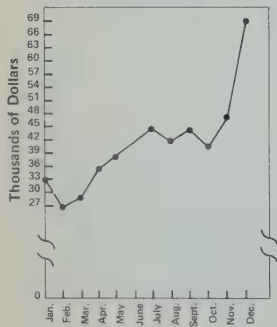
1. \$808.00 2. \$0.53 3. 1103 4. \$96.84 5. \$2.28 6. \$6.60 7. \$875.00 8. \$0.53 9. 419 10. 95.20 11. \$2.28 12. 6.75 13. 39.38 = 40 14. \$2455.05 15. \$21.77 16. 96.69 = 97 17. 1/38 18. 1/19 19. 2/19 20. 6/19 21. 9/19 22. 9/19; 9/19 23. 81/361; 81/361 24. 1/1444 25. 15% 26. 2/11

- 1. 27
- 2. at the end of each year
- 3. July-October
- 4. 5500
- 5. 37 000
- 6. \$14 000.00
- 7. \$19 500.00
- 8. \$71 300.00
- 9. 1973: \$10 400.00; 1974: \$15 500.00; 1975: \$19 100.00

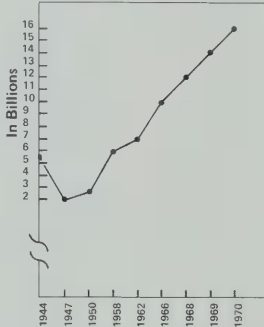
1 The Population of Canada from 1881 to 1971



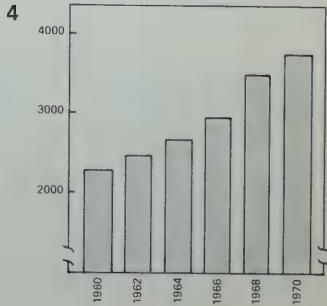
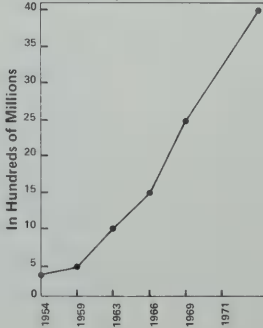
2 Sales by months for the year 1972 by Jantzen's Discount Store in Winnipeg.



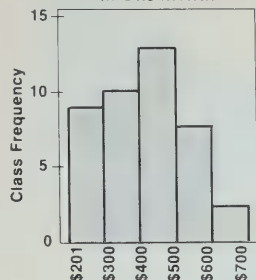
3 Total Federal Government Expenditures for selected years.



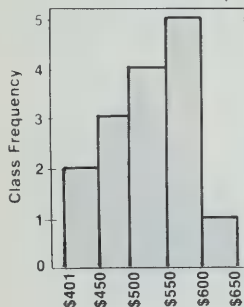
4 Expenditures for Health Care in Canada (in millions of dollars) for selected years 1954 to 1971.



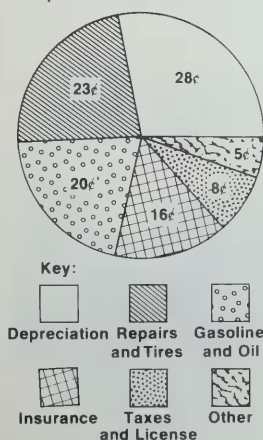
1. Television Sets Sold at Hodgkins TV. & Radio in One Month



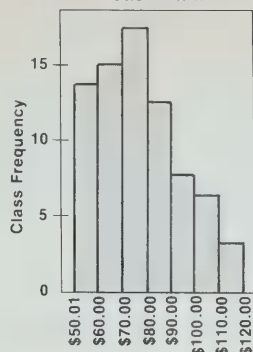
3. Sales by Salesmen for Evan's Furniture Store for One Week in May



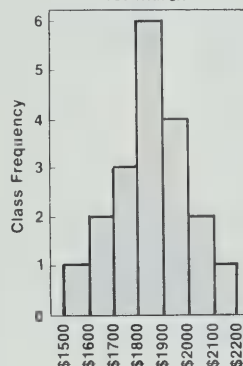
2. Cost of Owning and Operating an Automobile per Dollar in Manitoba



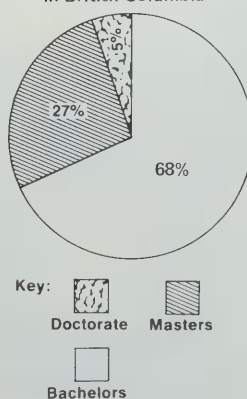
2. Men's Suits Sold by Brilland Gun in One Month



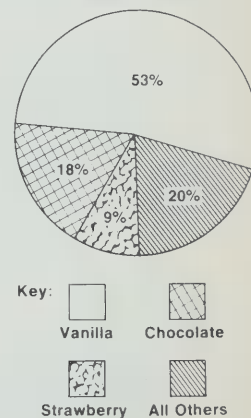
4. Sales by Salesmen for The London Garden Supply (1973) Ltd. for March



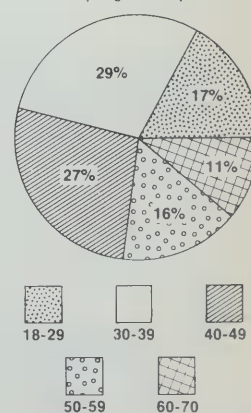
3. Educational Degrees of High School Teachers in British Columbia



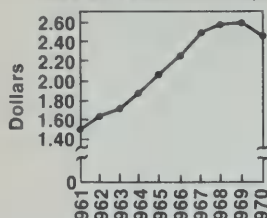
1. Consumption of Ice Cream by Flavors in Dartmouth, Nova Scotia



4. Employees of the province of Alberta by Age Groups

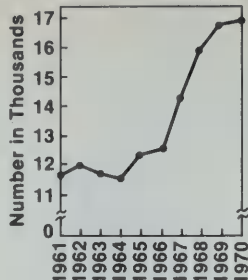


1. Earnings per Share of Common Stock of Pacific Gas and Electric Company



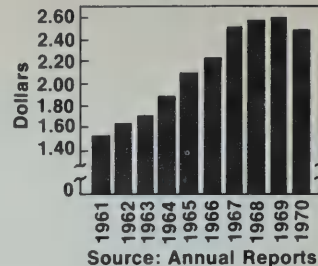
Source: Annual Reports

4. Number of Common Stockholders of the Alberta Gas Company



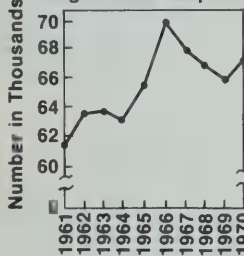
Source: Annual Reports

7. Earnings per Share of Common Stock of Wills Motors Ltd.



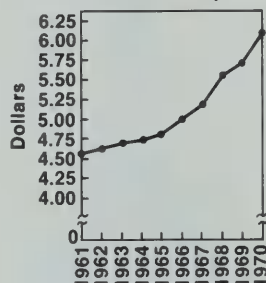
Source: Annual Reports

2. Number of Common Stockholders of the Borg-Warner Corporation



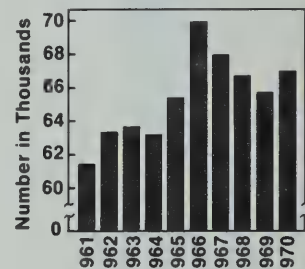
Source: Annual Reports

5. Hourly Employment Costs of Griffin Steel Corporation



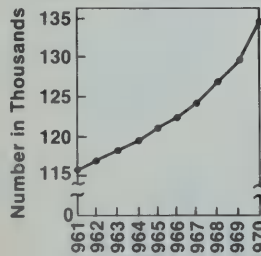
Source: Annual Reports

8. Number of Common Stockholders of the Borg-Warner Corporation



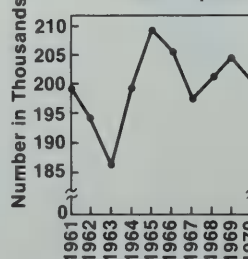
Source: Annual Reports

3. Number of Customers of the Idaho Power Company



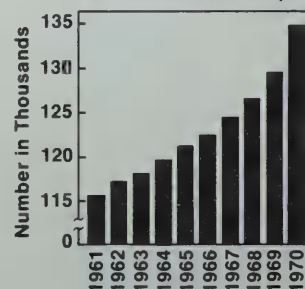
Source: Annual Reports

6. Number of Employees of Griffin Steel Corporation



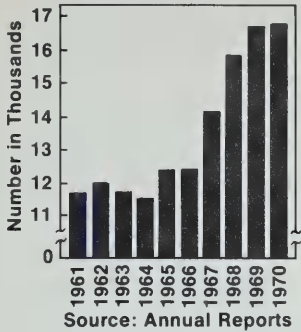
Source: Annual Reports

9. Number of Customers of the Alberta Gas Company

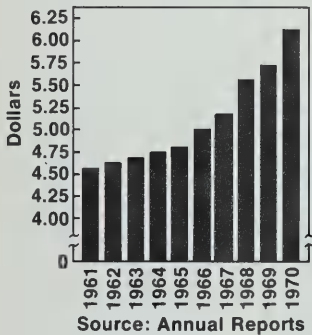


Source: Annual Reports

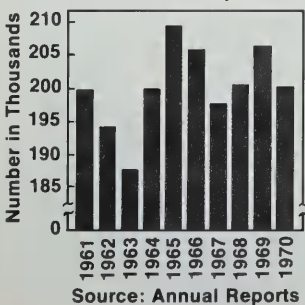
10. Number of Common Stockholders of the Alberta Gas Company



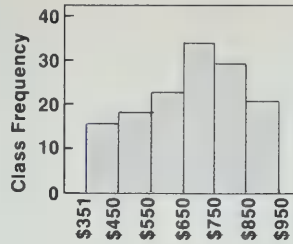
11. Hourly Employment Costs of Griffin Steel Corporation



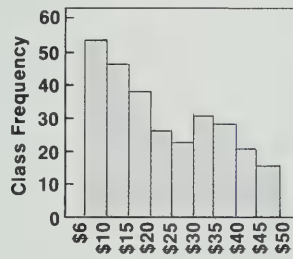
12. Number of Employees of Griffin Steel Corporation



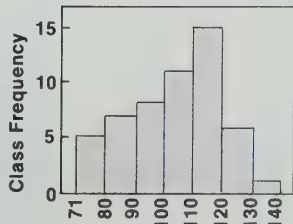
13. Monthly Salaries of Employees of the Gravy Company



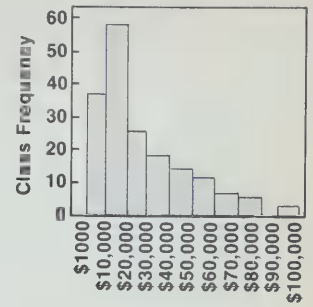
14. Contributions to the United Way by Employees of the Delicious Food Products Company



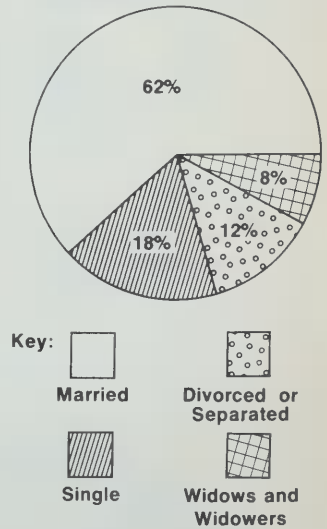
15. Golf Scores of Championship Tournament of Addison-Wesley Publishing Company



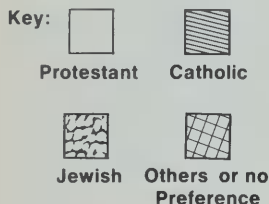
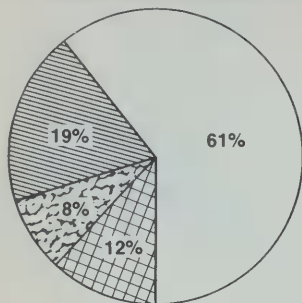
16. Amount of Life Insurance carried by Employees of Brian Green Company



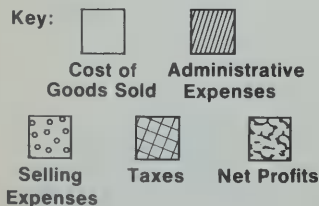
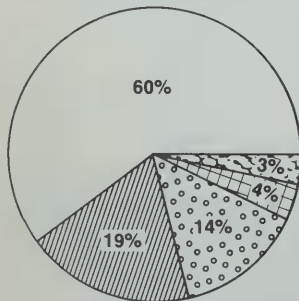
17. Marital Status of Employees of the Norton Company Ltd.



18. **Religious Preferences of Employees of the Rainbow Bubble Bath Company**



19. **Disposition of the Sales Dollar of Plastic Paper Products Company**



Page 100

1. \$0.98; \$2.27 2. \$2.60; \$3.90 3. \$3.28; \$6.57
 4. \$1.88; \$5.62 5. \$3.24; \$9.71 6. \$2.85; \$11.40
 7. \$7.75; \$7.75 8. \$6.62; \$3.23 9. \$3.75;
 \$21.23 10. \$5.25; \$47.25 11. \$18.75; \$56.25
 12. \$49.40; \$79.60 13. \$161.67; \$323.33 14.
 \$96.88; \$548.97 15. \$138.39; \$207.59

Page 101

1. \$0.19; \$9.16 2. \$0.09; \$8.46 3. \$0.29;
 \$14.21 4. \$0.38; \$18.37 5. \$0.89; \$28.91 6.
 \$0.99; \$48.51 7. \$1.40; \$54.45 8. \$1.86;
 \$72.39 9. \$1.25; \$82.02 10. \$1.50; \$98.25 11.
 \$4.91; \$240.59 12. \$15.50; \$759.75

Page 103

1. \$1.58; \$2.37 2. \$1.35; \$3.15 3. \$3.06;
 \$5.69 4. \$7.70; \$5.55 5. \$3.29; \$7.66 6.
 \$3.61; \$10.84 7. \$6.19; \$13.16 8. \$18.94;
 \$30.91 9. \$25.76; \$38.64 10. \$30.35;
 \$41.90 11. \$70.18; \$85.77 12. \$177.25;
 \$177.25 13. \$156.33; \$312.67 14. \$213.00
 \$355.00 15. \$270.09; \$365.41 16. \$246.19;
 \$649.06

Page 105

1. \$1.82; \$2.13 2. \$1.87; \$2.48 3. \$3.41;
 \$3.34 4. \$3.72; \$4.78 5. \$5.15; \$7.25 6.
 \$6.72; \$9.88 7. \$11.38; \$14.37 8. \$17.18;
 \$22.82 9. \$25.77; \$28.33 10. \$31.70; \$39.65
 11. \$39.98; \$46.92 12. \$49.55; \$49.85 13.
 \$114.05; \$120.15 14. \$161.78; \$204.72 15.
 \$281.43; \$249.82 16. \$319.10; \$423.00

Page 107

1. 52% 2. 43.6% 3. 41.5% 5. 43.58% 6.
 41.41% 7. 49.4% 8. 41.75% 9. 51.55% 10.
 47.08% 11. 43.84% 12. 46.5% 13. 46% 14.
 53.5% 15. 43% 16. 52.5% 17. 55% 18.
 48.85% 19. 48.3% 20. 50.7% 21. 47.22% 22.
 47.8% 23. 48.4% 24. 43.3% 25. 41.1% 26.
 44.75% 27. 42.8% 28. 43.75% 29. 40.63% 30.
 46.53%

Pages 108 and 109 (Problems)

1. \$9.22; \$27.66 2. \$43.63; \$130.87 3. \$4.90;
 \$19.60 4. \$3.99; \$15.96 5. \$25.33; \$50.67 6.
 \$8.55; \$17.11 7. \$1.27; \$62.00 8. \$2.57;
 \$125.82 9. \$1.45; \$46.90 10. no discount;
 \$110.00 11. \$1.55; \$60.55 12. \$3.13; \$121.87
 13. \$43.88; \$51.52 14. \$100.52; \$162.28 15.
 \$382.42; \$517.38 16. \$67.50 17. \$52.88;
 \$55.12 18. \$170.81; \$183.19 19. 24% 20.
 51.99% 21. 55.59% 22. 43.19% 23. 21.6% 24.
 43.13% 25. 37% 26. 48.3% 27. 60% 28. 48.7%
 29. 46.24% 30. 43.58%

Page 113

1. \$0.50; 20% 2. \$1.75; 30.4% 3. \$1.70; 25.4%
4. \$5.35; 40.1% 5. \$5.40; 35.1% 6. \$12.50; 50%
7. \$12.30; 45.1% 8. \$7.50; 28% 9. \$11.50; 32%
10. \$5.50; 18% 11. \$27.15; 42% 12. \$28.80;
37% 13. \$42.68; 44% 14. \$48.55; 46% 15.
\$37.50; 33-1/3% 16. \$34.90; 27.5%

Page 115

1. \$39.00 2. \$0.11 3. \$2.33 4. \$2.33 4.
\$3441.56 5. \$1.40 6. \$26.14 7. \$63.64 8.
\$0.48 9. \$67.50 10. \$0.80 11. \$6.36 12.
\$9.13 13. \$26.67 14. \$23.15 15. \$200.00 16.
\$75.00

Page 117

1. \$1.00; \$2.00 2. \$2.25; \$2.75 3. \$1.79;
\$4.54 4. \$5.31; \$9.56 5. \$4.75; \$9.75 6.
\$11.03; \$18.38 7. \$7.86; \$17.11 8. \$7.39;
\$17.24 9. \$4.71; \$15.17 10. \$5.02; \$19.35 11.
\$4.56; \$22.80 12. \$13.13; \$39.38 13. \$28.50;
\$76.00 14. \$112.21; \$176.33 15. \$11.25;
\$86.25 16. \$138.15; \$230.25

Page 119

1. \$14 340.00; \$717.00 2. \$23 097.09; \$692.91
3. \$44 499.04; \$1779.96 4. \$54 200.00 \$1084.00
5. \$64 315.24; \$3215.76 6. \$72 877.67; \$2186.33
7. \$87 446.67; \$4372.33 8. \$100 452.94;
\$2009.06 9. \$205 651.43; \$10 282.57 10.
\$343 268.87; \$20 596.13 11. \$449 497.61;
\$20 227.39 12. \$518 973.91; \$18 164.09 13.
\$694 967.80; \$17 374.20 14. \$876 672.73;
\$39 450.27

Page 121

1. \$1710.11 2. \$711.42 3. \$2596.93 4.
\$3655.26 5. \$2878.04 6. \$1867.66 7. \$991.77
8. \$1954.39 9. \$8631.66 10. \$2873.22 11.
\$8904.94 12. \$20 209.10 13. \$35 498.55 14.
\$37 415.81 15. \$52 413.48 16. \$68 146.41

Page 123

1. Sales. \$38 227
Cost of Goods Sold:

Inventory (October 1)	\$92 696
Plus Purchases	+ 21 554
Total Offered for Sale	\$114 250
Less Inventory (Oct. 31)	— 89 325

Cost of Goods Sold 24 925

Gross Profit	\$13 302
Operating Expenses	7128
NET PROFIT	\$ 6174

2. Sales \$59 114
Cost of Goods Sold:

Inventory (October 1)	\$151 922
Plus Purchases	+ 37 850
Total Offered for Sale	\$189 772
Less Inventory (Oct. 31)	— 148 995

Cost of Goods Sold 40 777

Gross Profit	\$18 337
Operating Expenses	14 100
NET PROFIT	\$ 4237

3. Sales. \$59 595
Cost of Goods Sold:

Inventory (Oct. 1)	\$121 263
Plus Purchases	+ 48 457
Total Offered for Sale	\$169 720
Less inventory (Oct. 31)	— 125 832

Cost of Goods Sold 43 888

Gross Profit	\$15 707
Operating Expenses	9 025
NET PROFIT	6 682

4. Sales \$44 601
Cost of Goods Sold:

Inventory (Oct. 1)	\$75 245
Plus Purchases	+ 48 774
Total Offered for Sale	\$124 019
Less Inventory (Oct 31)	— 62 265

Cost of Goods Sold 61 754

Gross Loss	\$17 153
Operating Expenses	5 196
NET LOSS	\$22 349

5. Sales \$175 307
Cost of Goods Sold:

Inventory (Oct 1)	\$295 392
Plus Purchases	+142 853
Total Offered for Sale	\$438 245
Less Inventory (Oct 31)	—285 975

Cost of Goods Sold 152 270

Gross Profit	\$ 23 037
Operating Expenses	28 402
NET LOSS	5365

6. Sales \$ 6830
Cost of Goods Sold:

Inventory (Oct. 1)	\$ 9376
Plus Purchases	+ 2284
Total Offered for Sale	\$11 660
Less Inventory (Oct 31)	— 8942

Cost of Goods Sold 2718

Gross Profit	\$ 4112
Operating Expenses	1892
NET PROFIT	\$ 2220

7. \$6228.00 8. \$20 803.00 9. \$38 227.00 10.
\$68 785.00 11. \$326 227.00 12. \$108 076.00

Pages 124 and 125 (Problems)

1. 44% 2. 51.8% 3. 60.4% 4. 45% 5. 46.7% 6.
58.3% 7. 46% 8. 45% 9. \$26.11 10. \$0.82
11. \$28.88 12. \$1.96 13. \$5.00 14. \$9.90 15.
\$10.48 16. \$10.47 17. \$1.14; \$2.89 18. \$5.06;
\$11.01 19. \$3.88; \$7.76 20. \$4.95; \$10.45
21. \$10.70; \$30.15 22. \$4.59; \$9.42 23. \$0.88;
\$2.63 24. \$12.96; \$41.86 25. \$346.38 26.
\$366.30 27. \$538.32 28. \$626.00 29. \$548.80
30. \$477.80 31. \$925.80 32. \$584.85 33.
\$25 154.00 34. \$66 134.00 35. \$7916.00 36.
\$57 318.00 37. 7382.00 38. \$24 748.00 39.
\$8720.00 40. \$96 330.00

41. Sales..... \$ 20 000

Cost of Goods Sold:

Inventory (Sept. 1)	\$12 000
Plus Purchases	+ 15 000
Total Offered for Sale	\$27 000
Less Inventory (Sept. 30)	— 9839
Cost of Goods Sold	17 161
Gross Profit	\$ 2849
Operating Expenses	1000
NET PROFIT	\$ 1730

42. Sales..... \$ 6732

Cost of Goods Sold:

Inventory (Nov. 1)	\$ 9725
Plus Purchases	+ 4864
Total Offered for Sale	\$14 589
Less Inventory (Nov. 30)	— 9839
Cost of Goods Sold	4750
Gross Profit	\$ 1982
Operating Expenses	2359
NET LOSS	\$ (377)

43. Sales..... \$ 22 500

Cost of Goods Sold:

Inventory (Jan. 1)	\$10 000
Plus Purchases	+ 16 450
Total Offered for Sale	\$26 450
Less Inventory (Jan. 31)	— 9300
Cost of Goods Sold	17 150
Gross Profit	\$ 5350

Operating Expenses	8356
NET LOSS	\$ (3006)

44. Sales..... \$25 625

Cost of Goods Sold:

Inventory (Dec. 1)	\$ 9300
Plus Purchases	+ 20 790
Total Offered for Sale	\$30 090
Less Inventory (Dec. 31)	— 11 630
Cost of Goods Sold	18 460
Gross Profit	\$ 7165
Operating Expenses	11 950
NET LOSS	\$ (4785)

PAGE 131

1. Balance Plus Deposits in Transit	\$1397.73
Less Cheques Outstanding	— 693.75
Balance in Cheque/book	\$ 703.98

2. Balance Pluse Deposit in Transit	\$ 938.28
Less Cheques Outstanding	— 337.61
Balance in Cheque/book	\$ 600.67

3. Balance Plus Deposits in Transit	\$ 831.10
Less Cheques Outstanding	— 139.65
Balance in Cheque/book	\$ 691.45

4. Balance Plus Deposits in Transit	\$ 890.96
Less Cheques Outstanding	— 485.76
	\$ 405.20
Plus Bank Debit Memo	+ 2.95
Balance in Cheque/book	\$ 408.15

Page 133

1. Cheque No.	Amount
137	\$20.00
138	25.50
139	75.00
140	5.95
141	18.63
Total	\$145.08

2. Cheque No.	Amount
16	\$ 5.00
19	15.27
26	9.30
27	20.55
28	5.50
29	14.00
Total	\$69.62

Page 136

1. \$2.10 2. \$1.54 3. \$2.06 4. (\$2.50, \$2.80)
5. \$51.00 6. \$3.08

Page 139

1. Answers vary 2. \$252.50 3. eleven \$10.00
cheques; twelve \$20.00 cheques 4. upper left 5.
lower left 6. details of loss and serial number and
denominations of missing cheques 7. the purchaser,
the payee, the date, the amount, the bank employee's
signature.

Page 140

1. Balance in Bank Statement \$483.50
Plus Deposit in Transit +302.10
\$785.60

Less Cheques Outstanding

#93 \$14.27
#98 26.25
#99 50.00
#100 15.50 —106.02

Plus Bank Debit Memo + 10.00
Balance in Cheque Register \$689.58

2. Balance in Bank Statement \$472.28
Plus Deposit in Transit 0.00
\$472.28

Less Cheques Outstanding

#167 \$15.00
#177 20.29
#178 19.75
#179 50.00
#180 110.00 —215.04

Balance in Cheque Register \$257.24

3. Balance in Bank Statement \$375.00
Plus Deposit in Transit +296.43
\$671.43

Less Cheques Outstanding

#226 \$35.00
#235 15.18

#236 23.00
#237 11.50
#238 24.48

— 109.16

Actual Balance \$562.27
Error in #227 9.00
Balance in Cheque Register \$553.27

4. Balance in Bank Statement \$486.27
Plus Deposit in Transit 0.00
\$486.27

Less Cheques Outstanding

297 \$69.25
299 12.00
306 100.00
307 14.50
308 21.00

— 216.75

Plus Bank Debit Memo + 2.00
Balance in Cheque Register \$271.52

Page 141

5. \$2.40 6. \$0.40 7. \$1.26 8. \$2.38 9. \$0.40
10. \$2.94

Page 145

1. \$6.00 2. \$10.00 3. \$14.00 4. \$12.00 5.
\$29.75 6. \$40.00 7. \$66.13 8. \$60.00 9.
\$66.68 10. \$87.50 11. \$49.73 12. \$60.00 13.
\$50.60 14. \$99.00 15. \$95.00 16. \$69.00

Page 147

1. 1/73 2. 2/73 3. 3/73 4. 6/73 5. 31/365 6.
7/73 7. 9/73 8. 14/73 9. 15/73 10. 72/365 11.
18/73 12. 21/73 13. 24/73 14. 36/73 15. 45/73
16. 54/73

Page 149

1. 87 2. 306 3. 86 4. 92 5. 55 6. 51 7. 69 8.
93 9. 58 10. 88 11. 91 12. 188 13. 148 14.
101 15. 347 16. 63 17. 148 18. 276 19. 221
20. 248

Page 151

1. \$24.00 2. \$52.50 3. \$14.44 4. \$11.67 5.
\$3.84 6. \$8.25 7. \$15.19 8. \$23.61 9. \$17.36
10. \$19.22 11. \$21.18 12. \$31.84 13. \$64.04
14. \$21.77 15. \$35.75 16. \$72.49

Page 152

1. \$1.76 2. \$2.47 3. \$3.55 4. \$4.78 5. \$5.29
6. \$6.67 7. \$7.51 8. \$9.00 9. ——— 10. \$10.00
11. \$15.57 12. \$21.01 13. \$25.55 14. \$33.46
15. \$50.04 16. \$75.11

Page 153

1. \$5.00 2. \$8.00 3. \$11.67 4. \$18.67 5. \$24.00
6. \$30.00 7. \$15.75 8. \$20.17 9. \$24.92 10.
\$30.00 11. \$35.42 12. \$45.50

Page 154

1. \$5.00 2. \$11.25 3. \$12.50 4. \$15.00 5.
\$17.50 6. \$18.75 7. \$25.00 8. \$30.00 9. \$37.50
10. \$45.00 11. \$52.50 12. \$60.00

Page 155

1. \$5.00 2. \$6.75 3. \$9.38 4. \$10.42 5. \$10.00
6. \$18.75 7. \$8.75 8. \$26.25 9. \$15.00 10.
\$8.44 11. \$50.63 12. \$90.00 13. \$23.44 14.
\$14.06 15. \$9.00 16. \$22.00[±]

Page 157

1. \$0.55 2. \$1.18 3. \$12.71 4. \$13.15 5. \$16.44
6. \$19.73 7. \$26.30 8. \$39.45 9. \$1.27 10.
\$4.33 11. \$8.24 12. \$5.70 13. \$9.63 14.
\$11.35 15. \$10.81 16. \$17.20

Page 160 (Problems)

1. \$2.94 2. \$3.33 3. \$14.50 4. \$0.69 5. \$1.01
6. \$16.25 7. \$30.00 8. \$3.09 9. \$1.12 10.
\$14.23 11. \$11.48 12. \$108.86 13. 8-1/2%
simple interest 14. 7.4% 15. \$11.11 16. \$31.11
17. \$60.00 18. \$54.00 19. \$5.75 20. \$9.21
21. \$3.12 22. \$27.56 23. \$35.48 24. \$5.15 25.
\$3.65 26. \$14.95

Page 164

1. \$162.75 2. \$202.40 3. \$226.63 4. \$251.63
5. \$509.60 6. \$538.20 7. \$367.00 8. \$556.50
9. \$912.50 10. \$968.63 11. \$1098.00 12.
\$1140.63 13. \$1205.75 14. \$1258.13 15.
\$1295.00 16. \$1300.31

Page 165

1. 4.2% 2. 5.3% 3. 6.4% 4. 8.7% 5. 9.9% 6.
11.1% 7. 4.7% 8. 5.8% 9. 7.0% 10. 8.1% 11.
9.3% 12. 10.5% 13. 7.8% 14. 9.0% 15. 8.4%
16. 9.6%

Page 167

1. \$190.79 2. \$253.24 3. \$305.86 4. \$267.09
5. \$404.10 6. \$456.30 7. \$487.05 8. \$504.29
9. \$568.99 10. \$621.95 11. 647.49 12. \$659.01

Page 169

1. \$267.50 2. \$418.70 3. \$447.26 4. \$500.52
5. \$538.59 6. \$625.11 7. \$714.88 8. \$812.70
9. \$1022.35 10. \$925.22 11. \$921.58 12.
\$996.16 13. \$13.51 14. \$8.62 15. \$4.74 16.
\$24.69 17. \$9.06 18. \$14.99 19. \$17.88 20.
\$21.51 21. \$29.37 22. \$12.05 23. \$20.84 24.
\$49.15

Page 170

1. \$207.67 2. \$295.59 3. \$305.86 4. \$353.22
5. \$402.26 6. \$445.86 7. \$512.44 8. \$592.68
9. \$619.97 10. \$699.13 11. 699.94 12. \$819.26

Page 171

1. \$232.61 2. \$300.00 3. \$330.77 4. \$361.96
5. \$417.20 6. \$509.78 7. \$576.34 8. \$640.22
9. \$655.74 10. \$762.94 11. \$872.41 12. \$984.68
13. \$1096.49 14. \$1101.93 15. \$1104.97 16.
\$1108.65

Pages 172 and 173 (Problems)

1. \$437.00 2. \$523.25 3. \$230.00 4. \$489.04
5. \$296.49 6. \$184.26 7. 7.5% 8. 8.7% 9. 9.9%
10. 11.1% 11. 9.3% 12. 9.6% 13. \$243.14 14.
\$386.32 15. \$599.95 16. \$168.63 17. \$303.60
18. 324.54 19. \$303.29 20. \$397.74 21.
\$501.89 22. \$460.39 23. \$369.35 24. \$1003.70

Page 177

1. \$110.25; \$10.25 2. \$112.36; \$12.36 3.
\$114.49; \$14.49 4. \$116.64; \$16.64 5. \$578.81;
\$78.81 6. \$595.21; \$95.51 7. \$612.52; \$112.52
8. \$629.86; \$129.86 9. \$939.39; \$139.39 10.
\$966.36; \$166.36 11. \$993.84; \$193.84 12.
\$1021.83; \$281.83 13. \$1165.91; \$165.91 14.
\$1216.48; \$216.48 15. \$1252.73; \$252.73 16.
\$1270.24; \$270.24

Page 179

1. \$104.04; \$4.04 2. \$106.09; \$6.09 3. \$108.16; \$8.16 4. \$110.25; \$10.25 5. \$309.07; \$9.07 6. \$315.19; 7. \$321.37; \$21.37 8. \$327.61; \$27.61 9. \$742.85; \$42.85 10. \$764.91; \$64.91 11. \$787.40; \$87.40 12. \$810.34; \$110.34 13. \$1061.52; \$61.52 14. \$1126.16; \$126.16 15. \$1159.69; \$159.69 16. \$1093.08; \$93.08

Page 181

1. \$1.80; \$0.80 2. \$1.81; \$0.81 3. \$2.81; \$1.81 4. \$2.21; \$1.21 5. \$128.20; \$28.20 6. \$160.47; \$60.47 7. \$214.54 8. \$203.99; \$103.99 9. \$1159.69; \$159.69 10. \$1343.92; \$343.92 11. \$1511.07; \$511.07 12. \$1884.54; \$884.54 13. \$3437.11; \$2437.11 14. \$3262.04; \$2262.04 15. \$2206.11; \$1206.11 16. \$2665.84; \$1665.84

Page 183

1. 5.06% 2. 5.09% 3. 6.09% 4. 6.14% 5. 7.12% 6. 7.19% 7. 8.16% 8. 8.24% 9. 10.25% 10. 10.38% 11. 12.36% 12. 12.55%

Page 185

1. \$0.952380 2. \$0.943396 3. \$0.873438 4. \$0.793832 5. \$82.07 6. \$74.41 7. \$66.18 8. \$533.91 9. \$780.01 10. \$659.10 11. \$499.60 12. \$386.54 13. \$277.83 14. \$341.36 15. \$214.86 16. \$464.41

Pages 186 and 187 (Problems)

1. \$2043.48 2. \$404.06 3. \$11.36 4. \$270.61 5. \$68.78 6. \$321.56 7. \$722.41 8. \$20 681.50 9. \$415.52 10. \$742.47 11. \$55.37 12. \$3724.30 13. \$788.03 14. \$97.65 15. \$6554.67 16. (a) \$3673.02 (b) \$3679.24

Page 193

1. \$2.15 2. \$2.70 3. \$11.70 4. \$13.05 5. \$26.75 6. \$34.75 7. \$36.25 8. \$32.50 9. \$33.85 10. \$53.30 11. \$56.95 12. \$89.10 13. \$97.60 14. \$96.30

Page 195

1. \$7.02 2. \$9.00 3. \$4.50 4. \$12.00 5. \$10.88 6. \$24.75 7. \$26.87 8. \$39.60 9. \$74.03 10. \$59.85 11. \$104.40 12. \$105.00 13. \$101.25 14. \$194.40 15. \$247.50 16. \$245.63

Page 196

1. \$7.42 2. \$14.17 3. \$11.51 4. \$15.13 5. \$13.53 6. \$17.70 7. \$15.33 8. \$20.42 9. \$20.32 10. \$24.50 11. \$23.91 12. \$28.49 13.

\$29.71 14. \$36.55 15. \$33.40 16. \$42.20

Page 199

1. 41.1% 2. 31.5% 3. 42.7% 4. 32.0% 5. 38.2% 6. 32.4% 7. 22.4% 8. 27.7%

Page 201

1. 37.2% 2. 40.0% 3. 31.3% 4. 32.7% 5. 43.0% 6. 16.2% 7. 16.7% 8. 33.4% 9. 17.1% 10. 22.5% 11. 28.1% 12. 17.46% 13. 22.6% 14. 28.5% 15. 17.6% 16. 23.1%

Page 203

1. 30.0% 2. 29.3% 3. 28.4% 4. 24.4% 5. 30.4% 6. 29.1% 7. 28.5% 8. 27.6% 9. 24.8% 10. 29.7% 11. 28.5% 12. 27.8% 13. 1.0% 14. 24.3%

Page 204

1. \$13.63 2. \$17.67 3. \$15.76 4. \$18.17 5. \$19.67 6. \$21.00 7. \$22.71 8. \$21.08 9. \$21.50 10. \$22.94 11. \$25.22 12. \$30.28 13. \$34.50 14. \$38.50 15. \$40.36 16. \$44.25

Pages 206 and 207 (Problems)

1. \$4.50 2. \$60.00 3. \$158.10 4. \$37.50 5. \$132.00 6. \$18.30 7. \$36.00 8. \$54.00 9. \$120.00 10. \$6.00 11. \$12.15 12. \$14.40 13. \$11.57 14. \$13.60 15. \$11.20 16. \$10.33 17. \$12.94 18. \$15.73 19. 41.6% 20. 32.4% 21. 22.2% 22. 22.5% 23. 17.2% 24. 16.9% 25. 61.6% 26. 53.8% 27. 44.3% 28. 35.7% 29. 34.2% 30. 34.5% 31. 40.2% 32. 34.6% 33. \$11.20 34. \$11.16 35. \$12.29 36. \$16.77 37. \$21.00 38. \$20.40

Page 211

1. \$0.72; \$10.00 2. \$140.00; \$10.00 3. \$3.35; \$11.34 4. \$7.04; \$23.83 5. \$10.83; \$36.63 6. \$12.24 \$41.41 7. \$13.56; \$45.87 8. \$14.32; \$48.44 9. \$10.33; \$52.18 10. \$17.46; \$88.18 11. \$19.54; \$98.69 12. \$20.09; \$126.54

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See page 439

Page 215

1. \$0.60; \$10.00; \$48.17 2. \$0.95; \$10.00; \$76.04 3. \$1.11; \$10.00; \$65.21 4. \$1.34; \$10.00; \$104.29 5. \$1.58; \$10.00; \$129.99 6. \$2.32; \$10.00; \$146.89 7. \$2.86; \$11.11; \$211.13 8. \$2.95; \$12.59; \$239.17 9. \$3.56; \$14.16; \$269.09 10. \$4.74; \$16.05; \$304.91 11. \$6.38; \$22.34; \$424.49 12. \$7.22; \$26.04 \$494.75 13. \$5.21; \$26.31; \$499.84 14. \$5.63; \$29.82; \$566.54 15. \$5.90; \$32.22; \$612.23 16. \$6.02; \$32.94; \$625.92

Page 216 (Problems)

1. \$1.26; \$10.00 2. \$2.45; \$10.69 3. \$3.80; \$12.86 4. \$5.40; \$19.55 5. \$6.23; \$22.35 6. \$8.17; \$27.64 7. \$8.79; \$32.25 8. \$9.02; \$34.68 9. \$9.66; \$32.69 10. \$81.22 11. \$103.34 12. \$131.10 13. \$179.62 14. \$243.41 15. \$314.82 16. \$360.95 17. \$429.01 18. \$572.18 19. \$122.75 20. \$280.89 21. \$277.69 22. \$450.90 23. \$422.15 24. \$617.89

Page 223

1. \$35.00 2. \$45.60 3. \$55.35 4. \$78.40 5. \$102.80 6. \$110.00 7. \$115.00 8. \$119.00 9. \$148.35 10. \$173.88 11. \$178.89 12. \$202.83 13. \$240.76 14. \$280.50 15. \$372.94 16. \$425.00

Page 225

1. \$152.96 2. \$154.24 3. \$153.92 4. \$126.72 5. \$152.64 6. \$157.76 7. \$144.50 8. \$147.00 9. \$125.00 10. \$144.00 11. \$143.00 12. \$143.50

Page 227

1. \$427.80 2. \$888.15 3. \$888.85 4. \$553.75 5. \$591.75 6. \$785.95 7. \$1195.30 8. \$775.55 9. \$597.10 10. \$836.70 11. \$971.90 12. \$617.65 13. \$2352.00 14. \$1164.45 15. \$1691.20 16. \$1564.80

Page 229

1. \$18.76 2. \$29.63 3. none 4. \$27.97 5. \$13.53 6. \$13.14 7. \$11.23 8. \$12.76 9. \$1.00 10. none 11. \$22.01 12. none 13. \$10.50 14. \$17.33 15. \$16.19 16. \$91.81

Page 231

1. \$1.83 2. \$18.94 3. \$3.73 4. \$10.75 5. \$16.50 6. \$3.64 7. \$8.19 8. \$20.74 9. \$3.27 10. \$25.87

Page 233

1. \$1.05 2. \$1.40 3. \$1.75 4. \$2.10 5. \$1.44 6. \$1.48 7. \$1.71 8. \$2.02 9. \$2.38 10. \$2.38

Page 235

1. \$15.75 2. \$18.50 3. \$14.65 4. \$24.00 5. \$28.75 6. \$32.10 7. \$34.10 8. \$28.20

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Name	Gross Pay	CPP	UI	Income Tax	Health Ins.	Union Dues	Group Ins.	Donations	Net Pay
Harvey	\$116.00	\$1.85	\$1.63	\$16.30	\$2.50	\$2.20	—	—	\$91.52
Edna	\$128.00	\$2.06	\$1.79	\$19.60	\$5.00	—	\$2.10	—	\$97.45
Ralph	\$146.00	\$2.39	\$2.05	\$15.60	\$5.00	—	—	\$1.00	\$119.96
Erin	\$142.60	\$2.32	\$1.99	\$23.45	\$2.50	—	—	—	\$112.34
Sam	\$235.20	\$4.00	\$2.38	\$39.95	\$5.00	—	—	—	\$183.87

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1. \$78.00 2. \$54.60 3. \$120.05 4. \$154.96 5. \$130.54 6. \$120.19 7. \$65.00 8. \$70.13 9. \$83.79 10. \$85.95 11. \$174.75 12. \$74.25 13. \$170.14 14. \$127.94 15. \$74.32 16. \$16.98 17. \$528.28 18. \$1357.50 19. \$4.00 20. \$2.19 21. \$3.50 22. \$2.59 23. \$4.18 24. \$3.13 (19). \$2.38 (20). \$1.89 (21). \$2.38 (22). \$2.20 (23). \$2.38 (24). \$2.38 26. (19). \$1706. \$51.50 (20). \$3198. \$12.85 (21). \$3518. \$32.10 (22). \$1706. \$27.60 (23). \$4104 \$38.80 (24). \$3198 \$27.25

	Name	Gross Pay	CPP	UI	Income Tax	Health Ins.	Union Dues	Net Pay
(19.)	Leonard	\$234.00	\$4.00	\$2.38	\$51.20	\$2.50	\$1.25	\$173.07
(20.)	Glen	\$135.00	\$2.19	\$1.89	\$12.85	\$5.00	\$1.25	\$111.82
(21.)	Isaac	\$208.00	\$3.50	\$2.38	\$32.10	\$5.00	\$1.25	\$163.77
(22.)	Lena	\$157.50	\$2.59	\$2.20	\$27.60	\$2.50	\$1.25	\$121.36
(23.)	Michael	\$246.00	\$4.18	\$2.38	\$38.80	\$5.00	\$1.25	\$194.39
(24.)	Edward	\$187.46	\$3.13	\$2.38	\$27.25	\$5.00	\$1.25	\$148.45

Page 242

1. \$65.80 2. \$73.40 3. \$62.90 4. \$65.50 5. \$75.90 6. \$83.40 7. \$90.40 8. \$90.30 9. \$103.10 10. \$102.40 11. \$107.60 12. \$107.40 13. \$59.60 14. \$55.30 15. \$70.30 16. \$81.20

Page 246

1. \$546.00; \$36.37 2. \$650.00; \$21.30 (refund) 3. \$494.04; \$34.08 (refund) 4. \$816.00; \$56.67 5. \$936.00; \$5.50 6. \$764.40; \$7.94 7. \$582.48; \$84.87 (refund) 8. \$1144.00; \$162.88 9. \$452.40; \$103.65 10. \$1055.64; \$83.38 (refund)

Page 247

1. \$1706.00 2. \$3198.00 3. \$1706.00 4.
\$2732.00 5. \$4104.00

Page 249

1. \$54.45 \$4.80 2. \$20.07 \$1.60 3. \$14.85
\$1.50 4. \$69.21 \$0.48 5. \$106.20 \$11.45 6.
\$33.88 \$4.27 7. \$12.60 — 8. \$9.24 \$0.86 9.
\$42.84 \$2.11 10. \$78.12 \$6.03

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1. \$0.03; \$0.52 2. \$0.01; \$0.21 3. \$0.04; \$0.93
4. \$0.05; \$1.00 5. \$0.09; \$1.94 6. \$0.49; \$10.24
7. \$0.64; \$13.53 8. \$0.76; \$16.01 9. \$1.23;
\$25.73 10. \$2.50; \$52.45 11. \$2.75; \$57.75
12. \$4.00; \$83.95 13. \$4.79; \$100.68 14. \$6.50;
\$136.45 15. \$11.01; \$231.26 16. \$128.92;
\$2707.30

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3. 89.8 4. 103.9 5. 89.6 6. 88.5 7. \$244.92 8.
\$311.25 9. \$73.80 10. \$514.31 11. \$38.25 12.
\$17.79 13. \$19.75 14. \$1379.79

Page 263

1. \$29.28 2. \$24.32 3. \$36.00 4. \$17.90 5.
\$48.78 6. \$69.39 7. \$84.53 8. \$193.25 9.
\$157.63 10. \$213.81 11. \$240.34 12. \$308.96
13. \$537.46 14. \$630.59 15. \$913.28 16.
\$1496.75 \$1366.49 18. \$1455.03

Page 265

1. \$117.69 2. \$147.63 3. \$58.49 4. \$75.35
5. \$38.60 6. \$65.13 7. \$47.99 8. \$65.03 9.
\$74.37 10. \$113.26 11. \$118.25 12. \$114.81
13. \$57.98 14. \$69.56 15. \$84.03 16. \$52.10

Page 267

1. 29.5% 2. 27.0% 3. 28.5% 4. 30.7% 5. 29-1/3%
6. 26.4% 7. 27.6% 8. 24.0% 9. 28.0% 10. 27.2%
11. 24.0% 12. 26-2/3% 13. 27.4% 14. 27.3%
15. 24.0% 16. 26.4%

Page 269

1. \$31.00; \$97.00; \$73.00 2. \$15.00; \$63.00;
\$46.00 3. \$54.00; \$118.00; \$91.00 4. \$64.00;
\$135.00; \$104.00 5. \$10.00; \$46.00; \$26.00 6.
\$24.00; \$84.00; \$64.00 7. \$18.00; \$61.00;
\$35.00 8. \$40.00; \$112.00; \$85.00 9. \$30.00;
\$71.00 10. \$15.00; \$63.00; \$46.00

Page 271

1. \$37.05 2. \$140.40 3. \$36.40 4. \$195.75 5.
\$88.40 6. \$201.60 7. \$131.30 8. \$33.80 9.
\$332.80 10. \$98.80 11. \$191.90

Page 273

1. \$171.60 2. \$124.20 3. \$122.20 4. \$255.00
5. \$143.00 6. \$210.60 7. \$132.60 8. \$132.60
9. \$265.20 10. \$132.60 11. \$193.80

Page 275

1. \$104.16 2. \$111.30 3. \$44.39 4. \$91.16 5. \$42.51 6. \$52.49 7. \$34.88 8. \$91.84 9. \$71.68 10. \$81.90 11. \$107.50 12. \$51.22 13. \$88.83 14. \$129.60 15. \$90.90 16. \$161.00

Page 277

1. \$130.45 2. \$139.39 3. \$56.05 4. \$109.32 5. \$53.45 6. \$66.45 7. \$43.89 8. \$115.99 9. \$89.78 10. \$104.72 11. \$130.76 12. \$66.39 13. \$108.22 14. \$160.19 15. \$117.05 16. \$197.54

Page 278

1. \$115.46 2. \$115.42 3. \$99.34 4. \$60.18 5. \$107.58 6. \$52.88 7. 23.2% 8. 22.7% 9. 22.5 10. 17.1% 11. 27.2% 12. 18% 13. \$267.00 14. \$295.20 15. \$253.50 16. \$114.40 17. \$218.40 18. \$228.80 19. \$110.70 20. \$24.22 21. \$63.70 22. \$149.06 23. \$42.25

Page 283

1. \$19.94 2. \$93.05 3. \$13.38 4. \$148.92 5. \$90.80 6. \$31.64 7. \$84.60 8. \$133.30 9. \$84.11 10. \$51.25 11. \$215.45 12. \$46.85 13. \$110.73 14. \$46.66 15. \$132.64 16. \$158.11

Page 284

1. \$4.93 2. \$5.36 3. \$11.53 4. \$6.50 5. \$107.87 6. \$62.03 7. \$178.37 8. \$27.42 9. \$43.41 10. \$24.27 11. \$45.97 12. \$33.84 13. \$10.69 14. \$8.42 15. \$8.42 16. \$13.21

Page 285

1. \$4921.26 2. \$5597.01 3. \$6696.43 4. \$3683.69 5. \$15 991.47 6. \$16 393.44 7. \$9407.34 8. \$9225.09 9. \$9057.97 10. \$8861.70 11. \$4975.12 12. \$4878.05 13. \$4780.11 14. \$4706.21 15. \$15 456.00 16. \$51 546.00

Page 286

1. \$13.00 2. \$330.00 3. \$60.00 4. \$1057.00 5. \$684.00 6. \$1512.00 7. \$630.00 8. \$1450.00 9. \$2310.00 10. \$312.00 11. \$1056.00 12. \$1884.00

13. \$1689.50 14. \$4448.50 15. \$8478.50 16. \$8993.25

Page 288

1. Cost: \$73.00 2. Cost: \$53.00 3. Cost: \$44.80 4. Cost: \$113.25 5. Cost: \$112.80 6. Cost: \$183.60 7. Cost: \$324.80 8. Cost: \$128.00 9. Gain: \$689.48 10. Gain: \$193.20 11. Gain: \$401.85 12. Gain: \$109.20 13. Gain: \$840.42 14. Gain: \$120.35 15. Gain: \$767.44 16. Gain: \$527.43

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1. 4 2. 24 3. 57 4. 43 5. 70 6. 37 7. 14 8. 43 9. 28 10. 18 11. 29 12. 18

Pages 292 and 293 (Problems)

1. (a) \$20 618.56 (b) \$7727.98 (c) \$4610.42 (d) \$3573.98 (e) \$1901.08 (f) \$98.92 2. (a) \$48.50 (b) \$129.40 (c) \$216.90 (d) \$279.80 (e) \$4404.00 (f) \$14 295.92 (g) Gain: \$6295.92 3. (a) \$72.75 (b) \$37.10 (c) \$18.92 (d) \$6.42 (e) \$378.40 4. (a) \$28 550.00 (b) Gain: \$2670.00 (c) \$12 300.00 (d) Cost: \$640.00

Page 299

1. 26.4%, 14.3%, 7.7%, 15.7%, 14%, 12.8%, 9.1% 2. 27.2%, 13.7%, 9.4%, 15%, 12.8%, 13.1%, 8.8% 3. 22.5%, 13%, 8.9%, 12.3%, 14.1%, 13.6%, 15.6% 4. 24.5%, 13%, 10.9%, 12.6%, 14.1%, 13.3%, 11.6% 5. 19.3%, 12.1%, 8.3%, 10.7%, 14%, 14.9%, 20.7% 6. 13.3% 7. 24% 8. 13.2% 9. \$129.53, \$66.73, \$39.25, \$219.80, \$133.45, \$117.75, \$78.50

Page 301

1. \$140.00 2. \$45.00 3. \$16.00 4. \$4.67 5. \$45.00 5. \$30.33 7. \$105.39 8. \$54.58 9. \$24.83 10. \$90.00 11. \$107.50 12. 15.4%, 9.9%, 10.7%, 21.5%, 8.7%, 19.3%, 14.5% (Savings)

Page 304

1. 14.6% 2. 4.4% 3. 6.1% 4. \$48.00 5. \$17.10 6. \$42.50

1. Opening Balance	\$52.05	7. Opening Balance	\$85.15	12. Opening Balance	\$93.12
Finance Charge	.78	Finance Charge	1.28	Finance Charge	1.40
Purchases	31.15	Purchases	38.75	Purchases	48.07
Closing Balance	\$83.98	Closing Balance	\$125.18	Closing Balance	\$142.59
2. Opening Balance	\$35.50	8. Opening Balance	\$105.12	13. Opening Balance	\$137.11
Finance Charge	.53	Finance Charge	1.58	Finance Charge	2.06
Purchases	29.63	Purchases	20.33	Purchases	28.36
Closing Balance	\$65.66	Closing Balance	\$127.03	Closing Balance	\$167.53
3. Opening Balance	\$51.25	9. Opening Balance	\$80.27	14. Opening Balance	\$115.10
Finance Charge	.77	Finance Charge	1.20	Finance Charge	1.73
Purchases	92.00	Purchases	23.19	Purchases	37.52
Closing Balance	\$144.02	Closing Balance	\$104.66	Closing Balance	\$154.35
4. Opening Balance	\$60.19	10. Opening Balance	\$95.33	15. Opening Balance	\$110.18
Finance Charge	.90	Finance Charge	1.43	Finance Charge	1.65
Purchases	84.27	Purchases	42.29	Purchases	95.78
Closing Balance	\$145.36	Closing Balance	\$139.05	Closing Balance	\$207.61
5. Opening Balance	\$65.92	11. Opening Balance	\$60.53	16. Opening Balance	\$167.86
Finance Charge	.99	Finance Charge	.91	Finance Charge	2.52
Purchases	25.78	Purchases	15.75	Purchases	61.15
Closing Balance	\$92.69	Closing Balance	\$77.19	Closing Balance	\$231.53
6. Opening Balance	\$84.26				
Finance Charge	1.26				
Purchases	34.47				
Closing Balance	\$119.99				

1. Budget Controlmaster

 Month: March

 Year: 1976

		1	2	3	4	5	6
	Account	Approved Monthly Budget	Actual Monthly Expenses	Budget Gain (Loss)	Prior Monthly Balances	Budget Transfers	Current Monthly Balances
I	FOOD	124 00	129 00	(5 00)	23 50		18 50
II	HOUSEHOLD OPERATIONS						
	A. Furniture & Equipment	30 00	10 50	19 50	49 20		68 70
	B. Heat & Light	20 00	21 00	(1 00)	80		(20)
	C. Water	6 00	6 00		50		50
	D. Cable TV	4 00	4 00				
	E. Telephone	5 00	4 50	50	(1 00)		(50)
	Sub-totals	65 00	46 00	19 00	49 50		68 50
III	CLOTHING	40 00	23 60	16 40	55 15		71 55
IV	SHELTER						
	A. Rent or Payment	150 00	150 00				
	B. Homeowner's Insurance	4 00		4 00	8 00		12 00
	C. Repairs & Maintenance	15 00	12 40	2 60	30 00		32 60
	D. Taxes	40 00		40 00	80 00		120 00
	Sub-totals	209 00	162 40	46 60	118 00		164 60
V	TRANSPORTATION						
	A. Auto Payments	68 50	68 50				
	B. Auto Insurance	15 00		15 00	30 00		45 00
	C. Repairs & Lubrication	25 00	14 30	10 70	34 10		44 80
	D. Gasoline & Oil	20 00	21 50	(1 50)	1 40		(10)
	E. Bus & Carfares						
	Sub-totals	128 50	104 30	24 20	65 50		89 70
VI	PERSONAL ADVANCEMENT						
	A. Health	25 00	35 00	(10 00)	50		(9 50)
	B. Health Insurance	20 00		20 00	40 00		60 00
	C. Education	10 00		10 00	20 00		30 00
	D. Recreation & Entertainment	15 00	10 80	4 20	14 75		18 95
	E. Publications	7 50	8 75	(1 25)	11 00		9 75
	F. Contributions	7 00	5 00	2 00	4 00		6 00
	G. Vacations	25 00		25 00	50 00		75 00
	Sub-totals	109 50	59 55	49 95	140 25		190 20
VII	SAVINGS	75 00		75 00	370 00		445 00
	GRAND TOTALS	751 00	524 85	226 15	821 90		1048 05

2. Budget Controlmaster

Month: April Year: 1976

		1	2	3	4	5	6
	Account	Approved Monthly Budget	Actual Monthly Expenses	Budget Gain (Loss)	Prior Monthly Balances	Budget Transfers	Current Monthly Balances
I	FOOD	124 00	133 50	(9 50)	18 50		9 00
II	HOUSEHOLD OPERATIONS						
	A. Furniture & Equipment	30 00		30 00	68 70		98 70
	B. Heat & Light	20 00	18 80	1 20	(20)		1 00
	C. Water	6 00	6 50	(50)	50		
	D. Cable TV	4 00	4 00				
	E. Telephone	5 00	6 00	(1 00)	(50)		(1 50)
	Sub-totals	65 00	35 30	29 70	68 50		98 20
III	CLOTHING	40 00	22 75	17 25	71 55		88 80
IV	SHELTER						
	A. Rent or Payment	150 00	150 00				
	B. Homeowner's Insurance	4 00		4 00	12 00		16 00
	C. Repairs & Maintenance	15 00		15 00	32 60		47 60
	D. Taxes	40 00		40 00	120 00		160 00
	Sub-totals	209 00	150 00	59 00	164 60		223 60
V	TRANSPORTATION						
	A. Auto Payments	68 50	68 50				
	B. Auto Insurance	15 00	45 00	(30 00)	45 00		15 00
	C. Repairs & Lubrication	25 00	3 00	22 00	44 80		66 80
	D. Gasoline & Oil	20 00	24 35	(4 35)	(10)		(4 45)
	E. Bus & Carfares						
	Sub-totals	128 50	140 85	12 35	89 70		77 35
VI	PERSONAL ADVANCEMENT						
	A. Health	25 00		25 00	(9 50)		15 50
	B. Health Insurance	20 00	60 00	(40 00)	60 00		20 00
	C. Education	10 00	15 00	(5 00)	30 00		25 00
	D. Recreation & Entertainment	15 00	9 60	5 40	18 95		24 35
	E. Publications	7 50	3 65	3 85	9 75		13 60
	F. Contributions	7 00	5 00	2 00	6 00		8 00
	G. Vacations	25 00		25 00	75 00		100 00
	Sub-totals	109 50	93 25	16 25	190 20		206 45
VII	SAVINGS	75 00		75 00	445 00		520 00
	GRAND TOTALS	751 00	575 65	175 35	1048 05		1223 40

Pages 306 and 307 (cont'd)

3. Food: 16.5%; Furniture and Equipment: 4%; Heat and Light: 2.7%; Water: .8%; Disposal: 5%; Telephone: .7%; Clothing: 5.3%; Rent or Payment: 20%; Homeowner's Insurance: 5%; Repairs and Maintenance: 2%; Taxes: 5.3%; Auto Insurance: 2%; Repairs and Lubrication: 3.3%; Gas and Oil: 2.7%; Health: 3.3%; Health Insurance: 2.7% Education: 1.3%; Recreation and Entertainment: 2%; Publications: 1%; Contributions: .9%; Vacations: 3.3%; Savings: 10%. 4. \$156.75; \$19.75; \$17.80; \$21.11; \$8.91; \$4.10

Page 311

1. \$3750.00; \$6250.00 2. \$6136.36; \$8863.64 3. \$11 666.67; \$8333.33 4. \$10 000.00; \$15 000.00 5. \$14 062.50; \$15 937.50 6. Loss: \$1489.58; Loss: \$1760.42 7. Loss: \$2148.64; Loss: \$2431.36 8. \$15 886.36; \$19 063.64 9. Loss: \$1273.40; Loss: \$1576.60 10. Loss: \$2905.50; Loss: \$1564.50 11. \$6832.58%; \$8637.42 12. \$10 120.00; \$11 806.67; \$13 493.33 13. \$11 044.44; \$13 253.33; \$15 462.22 14. Loss: \$1445.45; Loss: \$1766.67; Loss: \$2087.88 15. \$11 761.71; \$12 937.89; \$16 466.40 16. \$12 592.25; \$16 789.67; \$20 987.08

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1. \$4172.00; \$4172.00 2. \$7597.00 \$7772.00 3. \$12 717.00; \$12 517.00 4. Loss: \$903.50; Loss: \$975.50 5. Loss: \$7239.00; Loss: \$7399.00 6. \$16 716.50; \$16 476.50 7. \$19 580.00; \$19 400.00 8. \$22 670.00; \$22 730.00 9. \$9200.66; \$9280.66; \$9360.66 10. Loss: \$1503.33; Loss \$1663.33; Loss: \$1633.33

Page 315

1. Addison: \$6005.00; Rolland: \$4645.00 2. Ryan: \$19 601.75; Sage: \$14 183.25 3. Azevedo: \$11 109.00; Lewis: \$7779.00 4. Firestone: \$480.00; Ferguson: \$2010.00; Zilch: \$810.00

Page 316

1. Palmer: \$4875.00; Miller: \$5115.00 2. Larson: \$9029.00; Hawkins: \$9239.00 3. Hinwood: \$12 007.50; Wheeler: \$11 867.50 4. Saylor: \$23 893.50; Tipton: \$23 343.50 5. Arndt: \$7358.33; Carter: \$7758.33; Henderson: \$7858.33 6. Stewart: \$4386.66; Tolman: \$4296.66; Turner: \$4656.66 7. Brooks:

\$12 547.50; Talcott: \$14 797.50 8. Rosenberg: \$15 000.00; Kidwell: \$10 800.00 9. Mulligan: \$24 100.00; Carney: \$21 100.00 10. Raymond: \$3465.00; Birdwell: \$1925.00

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1. Imperial Oil 2. Barbr-Ell 3. Alta G.C.: IAC: IBM 4. Auto El; Bad Boy

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1. \$1045.00 2. \$1095.00 3. \$286.25 4. \$1382.50 5. \$1615.00 6. \$4746.88 7. \$1500.00 8. \$678.13 9. \$607.50 10. \$850.00 11. \$448.13 12. \$960.00 13. \$878.13 14. \$1690.50 15. \$4492.13 16. \$4031.25

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1. \$3637.50 2. \$5150.00 3. \$359.38 4. \$325.00 5. \$205.50 6. \$1479.38 7. \$792.50 8. \$440.63 9. \$1500.00 10. \$577.50 11. \$1535.63 12. \$1575.00 14. \$3206.25 15. \$1567.50 16. \$1546.88

Page 329

1. \$79.54 2. \$49.99 3. \$322.67 4. \$261.99 5. \$168.10 6. \$182.04 7. \$44.10 8. \$43.54 9. \$282.90 10. \$252.15

Page 332

1. 2.3% 2. 2.6% 3. 4.7% 4. 5.7% 6. 3.0% 7. 2.2% 8. 1.5% 9. 1.1% 10. 2.9% 11. 2.7% 12. 5.0% 13. 3.6% 14. 4.4% 15. 5.9% 16. 6.0%

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1. 16.9—1 2. 8.0—1 3. 19.6—1 4. 21.0—1 5. 36.2—1 6. 19.5—1 7. 17.3—1 8. 83.6—1 9. 27.8—1 10. 14.0—1 11. 20.6—1 12. 62.9—1 13. 35.4—1 14. 121.3—1 15. 7.2—1 16. 23.8—1

Pages 334 and 335 (Problems)

1. \$1956.57 2. \$589.37 3. \$1782.51 4. \$1029.11 5. \$1019.57 6. \$5139.97 7. \$1692.31 8. \$2596.90 9. \$2147.25 10. \$1026.25 11. \$400.21 12. \$2418.66 13. \$823.77 14. \$3393.42 15. \$2581.95 16. \$5062.47 17. \$1218.75 18. \$3159.82 19. \$625.33 20. \$6098.32 21. \$3700.30 22. \$4365.34 23. \$3419.24 24. \$675.76 25. 4.7% 26. 2.8% 27. 2.7% 28. 1.6% 29. 1.3% 30. 5.9% 31. 35.0—1 32. 19.4—1 33. 34.0—1 34. \$35.00 35. \$21.00 36. 26.8—1

1. \$8650.00 2. \$7600.00 3. \$5520.00 4.
\$3144.60 5. \$6110.00 6. \$5740.00 7.
\$13 960.00 8. \$18 900.00 9. \$1598.00 10.
\$2106.00 11. \$7380.00 12. \$4500.00 13.
\$8360.00 14. \$5100.00 15. \$11 082.50 16.
\$21 125.00

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1. 10.83% 2. 10.62% 3. 10.05% 4. 10.33% 5.
11.06% 6. 10.20% 7. 9.23% 8. 8.02% 9. 10.14%
10. 8.86% 11. 8.94% 12. 9.59% 13. 10.37%
14. 9.86% 15. 11.20% 16. 9.0%

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1. \$863.45 2. \$716.27 3. \$730.10 4. \$867.26
5. \$1048.32 6. \$1314.80 7. \$1710.67 8. \$535.20
9. \$815.51 10. \$795.82 11. \$1414.90 12.
\$125.64 13. \$609.64 14. \$775.76 15. \$788.69
16. \$722.65

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1. 4.3% 2. 6.6% 3. 6.8% 4. 4.1% 5. 3.5% 6.
7.1% 8. 6.5% 9. 5.8% 10. 4.2% 11. 4.0% 12.
7.4% 13. 9.6% 14. 7.8% 15. 3.4%

Pages 348 and 349 (Problems)

1. 5.0%; \$25.00; \$693.75; 1990 2. 3.8%; \$19.00;
\$722.50; 1981 3. 4.5%; \$22.50; \$680.00; 1987
4. 6.0%; \$30.00; \$717.50; 1987 5. 5.125%;
\$25.63; \$695.00; 1996 6. 4.75%; 23.75; \$751.25;
1987 7. 7.2% 8. 5.3% 9. 6.16% 10. 8.4% 11.
7.4% 12. 6.3% 13. \$672.12 14. \$976.06 15.
\$986.00 16. \$601.35 17. \$911.42 18. \$720.93
19. \$1050.60 20. \$1092.29 21. \$1173.01 22.
\$1276.78 23. \$1154.75 24. \$1190.50 25. 7.5%
26. 5.8% 27. 5.2% 28. 5.2% 29. 4.3% 30. 6.2%
31. 6.3% 32. 7.1%

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1. \$101.00 2. \$130.00 3. \$139.33 4. \$122.60
5. \$161.50 6. \$175.20 7. \$172.00 8. \$159.40
9. \$213.50 10. \$218.20 11. \$227.60 12. \$264.00
13. \$280.20 14. \$308.20 15. \$327.60 16.
\$596.00

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1. \$4.80; \$33.60 2. \$6.05; \$42.35 3. \$6.60;
\$46.20 4. \$7.20; \$50.40 5. \$7.25; \$50.75 6.
\$11.85; \$82.95 7. \$14.55; \$101.85 8. \$17.60;
\$123.20 9. \$8.58; \$60.30 10. \$8.25; \$57.75
11. \$9.46; \$66.22 12. \$12.43; \$86.98 13.
\$14.01; \$98.07 14. \$22.48; \$157.36 15. \$29.80
\$208.60 16. \$28.58; \$200.06

1. A: \$10 000; B: \$1000; C: \$5000, \$1500; D:
\$2000 2. A: \$15 000; B: \$1500; C: \$7500,

\$1500; D: \$3000 3. A: \$20 000; B: \$2000; C:
\$10 000, \$1500; D: \$4000 4. A: \$25 000; B:
\$2500; C: \$12 500, \$1500; D: \$5000 5. A:
\$27 500; B: \$2750; C: \$13 750, \$1500; D: \$5500
6. A: \$40 000; B: \$4000; C: \$20 000, \$2000; D:
\$8000

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1. \$4167 2. \$8333 3. \$10 000 4. \$4688 5.
\$14 063 6. \$15 000 7. \$5000 8. \$15 000 9.
\$20 000 10. \$10 464 11. \$22 321 12. \$25 000
13. \$5000 14. \$30 000 15. \$30 000 16. \$35 000

Pages 362 and 363 (Problems)

1. \$103.00 2. \$134.67 3. \$153.00 4. \$154.50
5. \$186.30 6. \$199.40 7. \$209.80 8. \$285.60
9. \$6.55; \$48.55 10. \$8.78; \$61.43 11. \$9.74;
\$68.15 12. \$11.15; \$78.05 13. \$13.47; \$94.29
14. \$14.55; \$101.85 15. \$12.39; \$86.73 16.
\$16.08; \$112.53 17. A: \$16 000; B: \$1600; C:
\$8000, \$1000; D: 3200 18. A: \$17 500; B:
\$1750; C: \$8750, \$1000; D: \$3500 19. A:
\$21 000; B: \$2100; C: \$10 500, \$1050; D: \$4200
20. A: \$24 500; B: \$2450; C: \$12 250, \$1225;
D: \$4900 21. A: \$28 000; B: \$2800; C: \$14 000,
\$1400; D: \$5600 22. A: \$29 500; B: \$2950; C:
\$14 750, \$1475; D: \$5900 23. A: \$31 000; B:
\$3100; C: \$15 500, \$1550; D: \$6200 24. A:
\$34 750; B: \$3475; C: \$17 375, \$1737.50; D:
\$6950 25. \$4598 26. \$8510 27. \$20 000 28.
\$24 000 29. \$10 600 30. \$18 365 31. \$16 940
32. \$25 000

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1. \$57.78 2. \$78.00 3. \$87.41 4. \$97.80 5.
\$95.89 6. \$107.84 7. \$95.16 8. \$108.14 9.
\$124.45 10. \$125.80 11. \$167.73 12. \$193.51
13. \$158.02 14. \$184.56 15. \$193.35 16.
\$199.15

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1. \$60.57 2. \$67.86 3. \$72.10 4. \$77.34 5.
\$86.61 6. \$93.08 7. \$94.75 8. \$102.39 9.
\$105.38 10. \$133.00 11. \$132.75 12. \$150.34
13. \$164.56 14. \$171.37 15. \$179.91 16.
\$194.65

Page 373

1. \$52.86; \$933.86 2. \$98.48; \$1739.78 3.
\$286.92; \$6025.38 4. \$437.98; \$9197.56 5.
\$160.07; \$2446.77 6. \$239.76; \$3664.88 7.
\$259.79; \$4589.58 8. \$384.31; \$6789.50 9.
\$569.80; \$10 929.81 10. \$685.57; \$13 150.41
11. \$774.08; \$14 848.31 12. \$1015.95; \$16 646.00
13. \$727.53; \$11 920.32 14. \$924.73; \$15 720.41
15. \$903.25; \$14 284.77 16. \$1019.62;
\$16 306.32

Pages 374 and 375 (Problems)

1. \$126.97 2. \$97.92 3. \$134.19 4. \$172.97 5. \$164.48 6. \$150.96 7. \$289.70 8. \$174.02

Payment

9. Number	Interest	Principal	Balance
			\$10 000.00
1	\$50.00	\$70.06	\$9929.94
2	\$49.65	\$70.41	\$9859.53
3	\$49.30	\$70.76	\$9788.77
4	\$48.94	\$71.12	\$9717.65
5	\$48.59	\$71.47	\$9646.18

Payment

10. Number	Interest	Principal	Balance
			\$15 000.00
1	\$75.00	\$27.47	\$14 972.53
2	\$74.86	\$27.61	\$14 944.92
3	\$74.72	\$27.75	\$14 917.17
4	\$74.59	\$27.88	\$14 889.29
5	\$74.45	\$28.02	\$14 861.27

11. Payment I

Number	Interest	Principal	Balance
			\$16 000.00
1	\$106.67	\$33.33	\$15 966.67
2	\$106.44	\$33.56	\$15 933.11
3	\$106.22	\$33.78	\$15 899.33
4	\$106.00	\$34.00	\$15 865.33
5	\$105.77	\$34.23	\$15 831.10

12. Payment

Number	Interest	Principal	Balance
			\$12 000.00
1	\$80.00	\$15.22	\$11 984.78
2	\$79.90	\$15.32	\$11 969.46
3	\$79.80	\$15.42	\$11 954.04
4	\$79.69	\$15.53	\$11 938.51
5	\$79.59	\$15.63	\$11 922.88

13. Payment

Number	Interest	Principal	Balance
			\$20 000.00
1	\$140.00	\$12.37	\$19 987.63
2	\$139.91	\$12.46	\$19 975.17
3	\$139.83	\$12.54	\$19 962.63
4	\$139.74	\$12.63	\$19 950.00
5	\$139.65	\$12.72	\$19 937.28

14. Payment

Number	Interest	Principal	Balance
			\$18 000.00
1	\$127.50	\$39.60	\$17 960.40
2	\$127.22	\$39.88	\$17 920.52
3	\$126.94	\$40.16	\$17 880.36
4	\$126.65	\$40.45	\$17 839.91
5	\$126.37	\$40.73	\$17 799.18

15. Payment

Number	Interest	Principal	Balance
			\$9900.00
1	\$74.25	\$14.83	\$9885.17
2	\$74.14	\$14.94	\$9870.23
3	\$74.03	\$15.05	\$9855.18
4	\$73.91	\$15.17	\$9840.01
5	\$73.80	\$15.28	\$9824.73

16. Payment

Number	Interest	Principal	Balance
			\$9000.00
1	\$75.00	\$43.94	\$8956.06
2	\$74.63	\$44.31	\$8911.75
3	\$74.26	\$44.68	\$8867.07
4	\$73.89	\$45.05	\$8822.02
5	\$73.52	\$45.42	\$8776.60

17. \$134.65 18. \$155.59 19. \$156.60 20. \$174.89 21. \$201.59 22. \$232.25 23. \$222.08 24. \$276.35 25. \$138.92 26. \$150.84 27. \$166.40 28. \$145.47 29. \$181.88 30. \$201.95 31. \$188.00 32. \$167.27 33. \$162.86; \$3420.10 34. \$302.05; \$5336.23 35. \$472.71; \$7225.71 36. \$438.59; \$8412.47 37. \$521.16; \$8859.64 38. \$264.25; \$4039.25 39. \$859.12; \$11 598.12 40. \$1067.86; \$22 425.06

Page 379

1. \$155.00 2. \$295.20 3. \$501.50 4. \$233.70 5. \$81.48 6. \$135.80 7. \$71.63 8. \$92.95 9. \$130.40

Page 381

1. \$286.90 2. \$129.11 3. \$15.37 4. \$168.73 5. \$68.31 6. \$184.44 7. \$284.17 8. \$136.62 9. \$179.31 10. \$235.67 11. \$133.20 12. \$174.10 13. \$6.83 14. \$92.22 15. \$116.89 16. \$368.87

Page 383

1. \$582.12 2. \$241.73 3. \$317.52 4. \$19.54 5. \$465.89 6. \$151.20 7. \$19.60 8. \$252.00 9. \$181.44 10. \$63.00 11. \$423.36 12. \$141.75 13. \$119.47 14. \$382.73 15. \$236.88 16. \$47.25

Page 385

1. 1, 5 litre can; \$16.95 2. 7, 5 litre cans and 1 litre; \$122.54 3. 1, 5 litre can and 1 litre; \$20.84 4. 1, 5 litre can and 2 litres; \$24.73 5. 1, 5 litre can and 2 litres; \$24.73

Page 386 (Problems)

1. \$147.00; \$128.70; \$372.60; \$256.25 2. \$151.59 3. \$310.00 4. 2, 5 litre cans and 4 litres; \$38.30

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Date Due

		APR 12 RETURN	
	AUG - 6 RETURN		
	JAN 24 RETURN		
	FEB 22 RETURN		
	MAR 2 RETURN		
	RETURNED APR 10 '78		
	FEB 20 RETURN		
	MAR 20 RETURN		
	APR 28 RETURN		
	DUE EDUC AUG 26 '81		
	RETURN AUG 14 '81		
	DUE EDUC NOV 23 '82		
	RETURN NOV 19 '82		
	DUE EDUC JAN 17 '83		
	RETURN JAN 26 '83		
	DUE EDUC MAR 12 '80		
	DUE EDUC APR 12 '80		

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